

Is “natural” good for you?

*Myths, perceptions and science
in advertising, marketing and the media*

Jennifer Frost

Assignment presented in partial fulfilment of the requirements for the degree of Master of Philosophy (Journalism) at the University of Stellenbosch.



Professor George Claassen

March 2008

Declaration

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature: Date:

Abstract

This assignment explores the assumptions and perceptions – both real, and created by the media, marketers and advertisers – surrounding the word “natural” when applied to health foods, vitamins, home remedies and medication. It also examines the anti-science stance taken by many promoters of such products and the appeal that stance holds for targeted consumers. In it an attempt is made to answer the following questions: What is the source of this apparently “anti-science” point of view? How have the media contributed to this type of sentiment? Why do so-called “natural” products hold more appeal to consumers than their synthetic equivalents? Is there a difference between such products? Is the difference real or perceived? Or, is it merely a media construct? Does the popularity of these ideas indicate a growing distrust of science and governments? What effect has the media’s portrayal of science had on peoples’ attitudes to it? And, above all, what have the media done to advance the idea that “natural” is good for you?

Samevatting

Hierdie werkstuk ondersoek die veronderstellings en persepsies – die werklike sowel as dié wat deur die media, bemarkers en adverteerders geskep word – met betrekking tot die woord “natuurlik” wanneer dit toegepas word op gesondheidsvoedsel, vitamien, boererate en medikasie. Dit bekyk ook die antiwetenskaplike houding wat baie voorstanders van sodanige produkte inneem en die trefkrag wat dié houding op die teikenmark uitoefen. In dié studie is ’n poging aangewend om die volgende vrae te beantwoord: Wat is die oorsprong van hierdie klaarblyklik “antiwetenskaplike” oogpunt? Hoe het die media bygedra tot dié idee? Hoekom is die sogenaamd “natuurlike” produkte soveel aantrekliker vir die gebruiker as hulle sintetiese ekwivalente? Is daar ’n verskil tussen sodanige produkte? Is daar ’n werklike verskil of is dit slegs ’n persepsie? Of is dit bloot ’n maaksel van die media? Dui die gewildheid van hierdie idees op ’n toenemende gebrek aan vertrouwe in die wetenskap en die owerhede? Watter uitwerking het die media se voorstelling van die wetenskap op mense se houding ten opsigte daarvan? En, veral, wat het die media gedoen ter bevordering van die idee dat “natuurlik” goed is vir jou?

Key words

Chemical, herbal, labelling, media, natural, natural food, organic, perceptions, pharmacological, product claims, pseudo-science, remedy, scientific, synthetic, traditional

My sincere thanks to all those who have supported and encouraged me over the years that it has taken to complete this course.

Contents

Introduction	7
<i>Chapter 1: The meaning of “natural”</i>	8
1.1 Chemical versus natural: sorting out the terminology	10
1.2 Natural, but not necessarily organic	12
<i>1.2.1 Behind the debate</i>	<i>12</i>
<i>1.2.2 As reported in the media</i>	<i>14</i>
1.3 The GM foods debate	18
<i>1.3.1 Behind the debate</i>	<i>18</i>
<i>1.3.2 As reported in the media</i>	<i>20</i>
<i>Chapter 2: Sound science or food faddism?</i>	<i>23</i>
2.1 Historical precedent	23
2.2 The phenomenon of faddism	24
2.3 Functional foods	28
2.4 Back to nature	29
2.5 An uneasy relationship	31
<i>Chapter 3: An appealing idea</i>	<i>33</i>
3.1 A disillusioned public	33
3.2 An unsympathetic medical profession	36
3.3 Alternative options	37
3.4 Environmental concerns	38
3.5 Links with the past	43
3.6 Religion and ceremony	43

<i>Chapter 4: Risky business</i>	45
4.1 A lack of regulation	45
4.2 Safety issues	46
4.3 The danger is in the quantity	47
4.4 Risk – what’s acceptable, what’s not	47
<i>Chapter 5: Conclusions</i>	50
Supplement	
Description of terms	54
Addenda	
Addendum A	58
Addendum B	59
Addendum C	60
Addendum D	61
Addendum E	62
Addendum F	65
Bibliography.....	69
Tables and Figures	
Figure 1.1: Organic Food. What’s your point of view?	14
Table 2.1: Examples of functional foods and their potential health benefits	29
Table 2.2: Examples of natural foods promoted as drugs	30
Table 3.1: Toxic chemicals in everyday life	40
Figure 4.1: Risks versus benefits. Four categories of complementary and alternative medicine, and the evidence for each:	49

Introduction

“You should try it. It’s completely natural.” One often hears or reads these words, or something similar. From Echinacea for cold prevention to guarana to stay awake, from sports nutrition supplements to hay fever remedies, the spectrum to which they’ve been applied is both broad and varied.

What do people actually mean when they describe something as being “natural”? Maybe they mean to say “herbal” or “botanical”? Or do they mean something that is made up of unrefined ingredients? Do *they* really know the difference? Have they examined the science, or are they acting on hearsay? Who, or what, is the source of their information and how reliable is that source? Is it the news media, advertising media, or advertising media masquerading as news media? Is the idea a fad – a fashion – or does it have a sound basis in science? And if there is a scientific foundation, what portion of the claims is science and what portion, hype, be it media hype or advertising hype?

Furthermore, the statement has other implications: whatever it is that they’re touting is a) safe/harmless and b) good for one. But is it really? Does the substance actually possess any curative powers or is it a harmless (and sometimes, expensive) placebo? And does it have any adverse interactions with prescription drugs? Which raises another million-dollar question: how safe is self-medication? Does the average person actually possess enough knowledge to make decisions that can be potentially dangerous to one’s health? If the source of this knowledge is the news media, how comprehensive is the information?

The inference that “natural” is synonymous with “healthy” also begs further examination. What is the source of that idea? The media? And why are people so willing to believe it? Is it sound science, or publicity? Or, is it redolent of past generations’ belief in magic and quackery? Could it be, that after centuries of scientific discovery and progress, human beings still give more credence to so-called “old wives’ tales” than to modern medicine and science? If this is indeed the case, why is there this distrust? What has science done, or not done, that has led to this state of affairs, and how have the media’s portrayal of science influenced public perceptions? Or are human beings so resistant to change that they are unable to embrace it?

In the pages that follow, I will attempt to clarify these issues and to provide answers to these questions. Definitions of the various terms used can be found on page 53.

Chapter 1

The meaning of “natural”

In the twenty-first century consumer society, the word “natural” appears in many places: on product labels; in product claims in advertisements and advertorials; in philosophy treatises; in trade- and consumer magazines; and in book titles. Used (and abused) to promote numerous different products and to allude to a Utopia-like state of well-being, it has become one of the buzzwords of the decade.

Even a cursory survey of the shelves of a health food store or pharmacy reveals an unusual prevalence of the word in phrases like “Natural weight-loss formula”, “Natural Fibre Drink”, “Natural Cough and Cold Syrup”, and “100% Natural Ingredients”. In addition to their claims, product names and brand names reflect this tendency, frequently incorporating the words “natural” or “nature”, for example, *Formule Naturelle*, *Natura* and *Nature’s Choice*. (Addendum A)

The trend is continued in television, radio and print advertisements, often in the form of enticing promises, like “Detox and Slim the natural way with Thalgo’s active seaweed extracts”, or warm-and-fuzzy allusions to a simpler, healthier way of life in the past, as implied in “Phyto Nova Natural Cough and Cold Syrup – as natural as your survival instinct”. (Addendum B)

Cosmetics, too, are not immune (Addendum C). With growing numbers of people suffering from sensitive skin, products with “natural” ingredients¹ are becoming an increasingly popular solution to the problem. Such products and the accompanying ideology are actively promoted and endorsed by the writers of women’s health and beauty magazines, such as *Zest* and *Shape*, as the following extract attests:

“Natural beauty and make-up products are popping up everywhere. ...up to 60% of the skin product used is absorbed and deposited into the circulatory system. And according to Dr Hauschka Skin Care, over a period of 60 years the average woman absorbs 13,5kg of the ingredients contained in moisturisers!² So it certainly helps if these ingredients are safe, nutritious and enriching.

¹ Problems associated with the usage of the terms, “natural” and “chemical” are discussed in detail on page 10.

² Statements such as these create insecurity in readers and, as Maslow’s *Hierarchy of Needs* tells us, fear is a major motivator. The need for safety/security is second only to the physiological needs of survival.

Lavender, rose, grapefruit, chamomile, neroli, tea tree, rooibos... products rich in natural ingredients like these are thought to be healthier and more beautifying alternatives³. So try it – connect your looks with nature, and feel naturally healthy and more radiant” (Younghusband, 2005: 90).

And of course, there are the book titles, of which there are, quite literally, hundreds. Some of these are genuinely useful; others however, are simply a collection of pseudo-scientific theories (Addendum D): “The Natural Way to Beat Depression”; “Balance Hormones Naturally”; “The Natural Way to Overcome Depression, Obesity and Insomnia”; “Asthma-Free Naturally”; “The Pill Book Guide to Natural Medicines”.

These examples illustrate the pervasiveness of the use of the word “natural”. They also serve to highlight how broadly the term is used, and the variations in meaning that exist within this usage. In a large number of cases, “natural” can, and should, be exchanged for “herbal” or “botanical” as many of the recommended products are extracted from plants (flowers, leaves, roots, bark and seeds). In such cases, either of these would be a more scientifically accurate term. However, from a marketing perspective, these descriptors just do not have the emotive appeal that “natural” does. In addition, the term “natural”, being broader in meaning, *does* cover various non-plant remedies and nutritional supplements such as iron (a mineral best absorbed from meat sources) and Omega-3 fatty acids (predominantly derived from fish oil).

The widespread appeal of the word “natural” – along with “healthy” and “organic” – to advertisers and consumers alike, has led to countries such as the United States of America (US) passing laws to regulate its use on food labels and in advertisements (Bowers, 2002).

South Africa is currently in the process of revising its own food labelling laws in an effort to ensure that more useful information is made available to consumers, and to curb misleading statements by marketers and advertisers, a move that will hopefully result in less confusion. Under the new laws, due to be introduced in 2009, imprecise, deceptive and biased descriptors such as “healthy”, “wholesome” and “nutritious” will be outlawed, and claims such as “light” and “low-fat” will have to be verified (Joseph, 2005).

³ Many consumer magazines make use of unqualified, open-ended assertions such as these. Who thinks that so-called natural ingredients are “healthier and more beautifying”? And these ingredients are “healthier and more beautifying alternatives” to what?

Chemical versus natural: sorting out the terminology

The use of the term “natural” can be viewed as problematic by purists – from a logical, as well as scientific, perspective.

This is because, essentially, all matter is made up of chemicals. Even we, as human beings, are one big conglomerate of chemicals. Chemicals are made up of any of a number of elements, all known ones of which are listed on the periodic table. Elements⁴, being the simplest forms of a substance, bond with themselves or with other elements to form molecules⁵. These, in turn, combine in various ways to form the multitude of compounds that constitute matter. Consequently, if all matter is made up of chemicals, then so are all “natural” substances. Which ultimately means that there is no *real* distinction between chemical and “natural”.

However, common usage differentiates between “chemical” and “natural”. Generally, “chemical” is used to refer to substances that are created “in a factory from less complex ingredients” (Crone, 1986: 4), while “natural” refers to substances found in nature, that is, not made by humankind. The confusion resulting from this somewhat illogical distinction in everyday use is a source of concern for many scientists, such as, James P. Collman, Professor Emeritus of Chemistry at Stanford University in the US. His book, *Naturally dangerous: surprising facts about food, health and the environment* (2001), attempts to debunk many of the common myths associated with “nature” and “natural”.

Ironically, a large number of the medicinal drugs in use today were initially of natural origin, that is, they were parts of plants or other living organisms that were found to have special properties – some good, and some bad. It probably took quite a lot of trial and error before our ancestors realised which was which. In fact, even now people die of poisoning from mistakenly identifying toxic mushrooms, or plants, as edible.

Numerous chemicals can be obtained both naturally and synthetically. Hugh Crone, in his book, *Chemicals and society* (1986: 4), illustrates this using the following examples. Alcohol made from crude oil is a synthetic chemical, but made from the fermentation of malted barley, is

⁴ “A substance that cannot be decomposed into simpler substances. In an element, all the atoms have the same number of protons or electrons, although the number of neutrons may vary.” (*Oxford Dictionary of Science*, 1999: 269)

⁵ “One of the fundamental units forming a chemical compound; the smallest part of a chemical compound that can take part in a chemical reaction.” (*Oxford Dictionary of Science*, 1999: 513)

completely natural. In the same way, penicillin can be made synthetically or fermented naturally, depending which is more economically viable.

One of the main advantages of a science-based drug industry is that it has taken much of the guesswork out of medicating. In the creation of many modern medicines, naturally occurring compounds are analysed by chemists to ascertain their constituent formulae and to attempt to isolate the active ingredient, that is, the part of the compound with healing properties. Once the active ingredient has been isolated, it can be recreated artificially (synthetically) in a laboratory, or an alternative, more easily available natural source can be found. Furthermore, by eliminating the inactive ingredients, chemists are able to create more efficient and safer drugs, the dosage and purity of which can be rigidly monitored and controlled.

A good example of the above process is aspirin, one of the most common over-the-counter medicines available today. Historical evidence exists that this drug has been in use for hundreds of years. Hippocrates, a Greek physician, wrote in the fifth century BC that early aspirin, derived from willow bark, was used to treat headaches and labour pains. Despite this early knowledge, it took another twenty-three centuries before modern chemists isolated the active ingredient in 1899. Since then, this extraordinary drug has been found to reduce inflammation, control fever and significantly lower the risk of cardiac disease by thinning the blood (Collman, 2001: 46).

Unfortunately, even a drug as “natural” as aspirin is not without dangers. It does have significant adverse effects for some people, most notably, stomach haemorrhage (Collman, 2001: 47), and for this reason is contra-indicated for young children. However, as with many of the choices we as human beings face, the risk must be weighed against the rewards. One of the media’s more important roles is to inform the public of both the risks and the rewards, even though the manner in which this is done can, on occasion, be questionable (for more on this, see chapter 5).

The chemical synthesis of naturally occurring substances has another, not so apparent, spin-off: it can benefit the environment. This benefit is twofold.

Firstly, a significant number of natural remedies, many of which are used by traditional healers, are harvested from endangered plants or animals, more often than not resulting in the death or destruction of the source. Without the manufacture of synthetic forms of these remedies (drugs) or the development of new, more efficient alternatives, these plants and animals face extinction. *News@Nature*, the online news arm of the scientific peer-review journal, *Nature*, highlighted an interesting – and unforeseen – benefit of synthetic drugs on the environment. The

report reveals the negative effect that Viagra, Pfizer's male impotency cure, has had on the illegal trafficking of the endangered wildlife products used in traditional aphrodisiacs in the East, particularly China (Carina, 2005).

Secondly, synthetic alternatives are a viable, more environmentally friendly solution to natural products where natural supplies are insufficient for large-scale, commercial harvesting (Collman, 2001: 59).

Unfortunately, in my opinion, the news media appears to be slower to latch on to these positive spin-offs of chemicals than it is to the more emotive, negative effects.

Natural, but not necessarily organic

Behind the debate

The last decade has seen a huge growth in the organic food market. Globally worth an estimated R207 billion (GBP 15 billion), the trend is the result of increasing concerns about personal health, animal welfare and environmental sustainability, particularly in the developed world (HSBC survey, 2006). By bringing to the public's notice dubious commercial, scientific, political and agricultural practices, the media have played a key role in the advancement of the pro-nature cause, including natural and organic agriculture.

In order for food to be labelled "Organic", producers must comply with rules laid down by various recognised certification agencies. Most of these rules concern traceability, natural weed- and pest control, and soil quality standards. Natural food production, on the other hand, is based on similar principles to organic, yet differs in that it is not formally certified and is thus not governed by a specific set of rules and regulations. Food can therefore be labelled "natural" without necessarily being "organic".

Organic food producers fertilise the soil with animal manure and plant compost, eschewing the nitrogen-based chemical fertilisers used in modern commercial agriculture. For many farmers, the reasons for choosing this route are based on concern for the environment, particularly the quality of freshwater supplies, which can become contaminated by algal blooms caused by fertiliser run-off (Collman, 2001: 99). This problem is encountered frequently in the Theewaterskloof dam in the Western Cape where the catchment area includes many commercial apple farms.

The quantity of pesticide residue present on fresh produce and the nutrient-content of the food we eat, have both become hot topics in the media, and are two of the main reasons for the growth in popularity of organic agriculture. The proponents of organic food production believe that soil quality has declined in the age of intensive agriculture, with vital nutrients, such as selenium, having become depleted in the soil – and consequently the food grown in it – as a result of incomplete fertilising and continuous irrigation. Consequently, the traditional farming practices of natural fertilisers (manure and compost), underplanting (for example, barley in grape vineyards) and crop rotation are favoured methods of soil enrichment.

The use of synthetic pesticides, fungicides and weedkillers is not permitted in organic farming. In contrast to “chemical” farming where all insects are killed – good and bad – organic farmers control pests using beneficial insect predators, such as ladybirds (eat aphids), companion planting (for example, French beans and cabbages keep away each other’s pests), and environmentally safe pesticides such as copper soap. Weed-control methods include hoeing, manual weeding and underplanting. (Palmer, 2000: 75–76)

However, the return to organic farming is not without hazards for human beings. Many scientists are opposed to the idea because of the increased possibility of disease from the deadly *Salmonella* and *E. coli* bacteria, which are carried in animal faeces. According to the US Center for Disease Control (CDC) cited by Collman in *Naturally Dangerous* (2001: 32), the risk of contracting food-borne disease is eight times greater for consumers of organic produce than for consumers of foods produced conventionally. In addition, organic food is considered to be more likely to contain allergens and natural toxins, such as aflatoxin (a compound produced by moulds), which can cause cancer and liver damage.

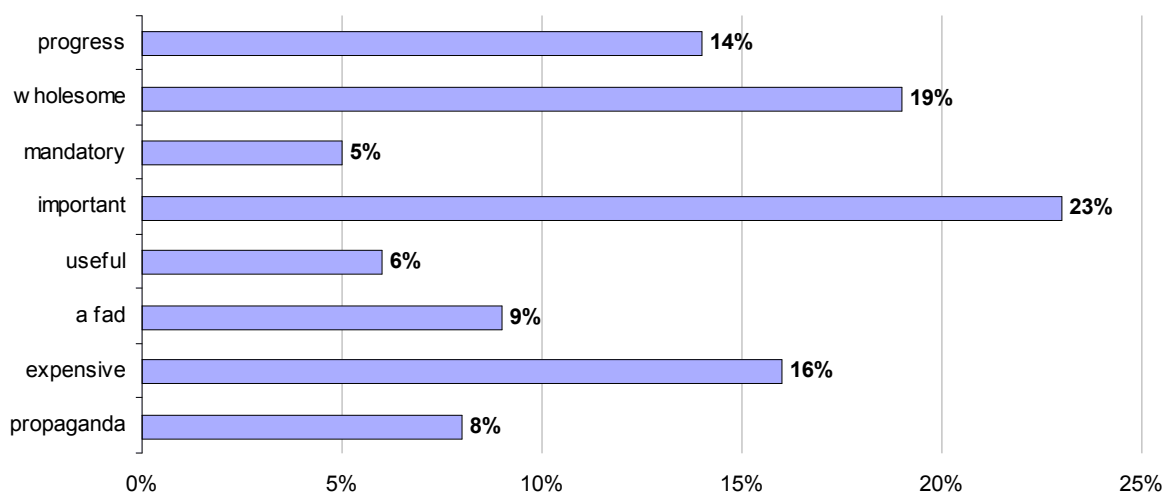
Besides the residues of manmade pesticides found on fresh produce, we consume many other pesticides on a daily basis (Professor Anthony Trewevas, cited by Cox, 2007). In nature, plants manufacture their own natural pesticides to protect themselves from insects. Those plants not protected by synthetic pesticides or herbicides have been found to contain higher levels of these naturally occurring pesticides, many of which are carcinogenic. Scientists fear that, over several generations, concentrations of these plant defence mechanisms can build up to levels that are toxic to human beings (Collman, 2001: 32–33).

Nevertheless, while this argument may be valid, it is necessary to point out that the use of synthetic chemicals in food production has only become commonplace since the Second World War (Wills, 1998: 69).

Food safety aside, one of the major drawbacks of organic farming is the cost of the produce. This is largely due to the fact that this style of agriculture requires more land and more labour to produce less produce. However, as consumer demand grows and the number of organic farmers increases, unit costs should be reduced (Wills, 1998: 71).

For many consumers, the price is justified by the perceived benefits of better taste⁶ (often true as organic produce is usually allowed to ripen on the plant, rather than picked green and artificially ripened with ethylene), greater nutritive value and environment-friendliness. An online survey of the opinions of 1 404 people around the world by international financial services provider HSBC (yourpointofview.com: October 2006), reveals that 23% of respondents believe that organic food is “important”, 19% that it is “wholesome” and 16% that it is “expensive”. Only 9% view it as “a fad”. Further analysis by country reveals that 23% of Australians think that it is expensive, but only 7% of South Africans are of the same opinion.

Figure 1.1: Organic food: What's your point of view?



Source: *yourpointofview.com*

As reported by the media

The pros and cons of organic and intensive farming have received a lot of attention in all forms of mass communication, with the debate seeming to switch sides frequently. This week it is good, the next week it is bad – depending on which groups have a vested interest in the results of

⁶ It should be noted that the perceived difference in taste mentioned here is not based on whether the produce is organic or not, but rather on how ripe it was when picked.

the research undertaken, and on which results have been published in the peer-review journals. Scientists appear to be unable to reach consensus, and with conflicting reports appearing regularly, the situation has become increasingly confusing for consumers.

One of the aspects of organic farming that has been most hotly debated in the media has been its sustainability. Many scientists are frustrated by the public's support for organic agriculture (Taverne cited by Claassen, 2006), viewing it as disastrous for future food security – and the environment (Goldberg, 2000). They predict that the requirement of larger areas of land in order to provide the same amount of produce as that yielded by intensive farming will encroach forests and conserved areas (Norman Borlaug⁷ cited in “Voting with your trolley”, 2006). Furthermore, they question whether there are sufficient sources of organic fertilisers such as manure (Goldberg, 2000).

Some researchers, however, have found that organic agriculture is sustainable. One study, published in *Nature* and cited in *New Scientist* (Samuel, 2001), compared the economic viability and environmental impact of organic, conventional and “integrated”⁸ apple farming over a period of three years. The organic orchard was found to be more energy efficient than the other orchards, with each apple produced needing lower inputs of water and labour. In addition, the organic produce received a higher price at market. These results are supported by those from a 21-year-long comparative research study undertaken in Switzerland which found organic farming to preserve biodiversity, enhance soil quality and to be more energy-efficient, than conventional agriculture (Pearce, 2002).

More recent research using data from multiple comparisons confirms these findings and concludes that the low input costs of organic farming relative to the input costs of conventional intensive farming make it a more viable and accessible option for poor farmers in developing countries. Extrapolations, based on figures from the UN Food and Agriculture Organisation, reveal that the worldwide application of organic farming methods could yield sufficient food to feed the world's people (Brahic, 2007). This contrasts with the ideas promoted by scientists who

⁷ Norman Borlaug is an agronomist and a Nobel peace prize laureate. A vocal supporter of synthetic fertilisers, he is regarded as father of the “green revolution” (“Voting with your trolley”, 2006).

⁸ Integrated agriculture is a combination of organic and conventional agricultural methods (Atkins and Bowler, 2001: 71).

believe that the biotech revolution is the future of food security (Taverne cited by Claassen, 2006).

For many consumers, the choice of organic produce over nonorganic is a moral, or ethical, choice; a conscious decision to attempt to right some of the world's social and environmental ills that have made headlines in the media. According to Marion Nestlé, a nutritionist at New York University (cited in "Voting with your trolley", 2006), consumers are expressing their concern through their buying decisions; the phenomenal growth in demand for organic produce is indicative of this.

Another reason why consumers buy organic produce is that they believe that it is healthier than conventional produce. Numerous research studies that have compared the nutritional content of both have, for the most part, produced inconclusive results. The headlines, however, have relished every finding, no matter how insignificant. The following are just a few of them: "There's not much that's special in organic wheat" (*New Scientist*, 2006); "Organic food 'better' for heart" (*BBC News*, 2007); "Organic food 'no healthier'" (*BBC News*, 2000); and "Organic veg given health boost" (*BBC News*, 2002).

Addendum E includes three articles taken from the news media that illustrate the above debate. An analysis of them reveals the opposing points of view expressed by their respective authors as well as the points that they have in common.

Article 1 appeared in *NewScientist* magazine in 2006. Under the headline, "There's not much that's special in organic wheat", the article begins with:

"If organic food really is healthier for you, it almost certainly has nothing to do with its nutritional content. A study comparing wheat grown organically and conventionally found that chemically they were virtually indistinguishable."

The remainder of the article continues in the manner of a news story. The tone is neutral in its description of the findings of a German study team who measured differences between the nutritional content of organically- and chemically fertilised wheat, and the methods that were used to achieve their results. The words used to describe the results of the study, "chemically...virtually indistinguishable", are, in essence, inconclusive and reinforce the "not much" in the headline. In contrast to mainstream consumer reports, scientific articles and science news reports are cautious in tone and often contain indefinite terms, such as "almost" and "may".

After reporting on the outcomes of the study, the story ends with a contradictory comment by a member of the United Kingdom (UK) Soil Association.

A 2007 BBC News story entitled, “Organic food ‘better’ for heart” (Article 2), discusses the discoveries of US research that suggest that organic produce is better than nonorganic. The story is obviously pro-organic, despite the writer attempting to bring impartiality into the mix by inserting a word of caution by a UK Food Standards Authority (FSA) spokesperson. The lead reads like this:

“Organic fruit and vegetables may be better for you than conventionally grown crops, US research suggests.

A ten-year study comparing organic tomatoes with standard produce found almost double the level of flavonoids – a type of antioxidant.

Flavonoids have been shown to reduce high blood pressure, lowering the risk of heart disease and stroke.”

The rest of the story is written in a similar vein, highlighting several other research studies that have yielded similar results.

The third article dates back to 2000. Entitled “Organic food ‘no healthier’”, it is a précis of an interview broadcast on BBC One’s *Countryfile*. The headline and lead are clearly meant to attract the attention of readers. By drawing them into the controversy, people from both sides of the debate would be curious to corroborate their beliefs, whether for or against. The story opens like this:

“Organic food is no safer or more nutritious than conventionally grown food, according to the chairman of the Food Standards Agency.

However, his comments have provoked protest from environmental groups.

Sir John Krebs told the BBC’s *Countryfile* programme that there was no evidence that organic food was healthier than conventionally grown produce.”

This news article can be divided into three distinct sections based on their content and bias. They are as follows: the lead and supporting paragraphs; the outcomes of a BBC-funded independent study (which support the statements in the first section); and a contrasting opinion provided by the UK Soil Association. The weighting is thus in favour of the proponents of modern agriculture, the antithesis of the weighting in article 2.

These articles illustrate the different ways in which the same subject has been reported at different times and from different perspectives. They also reflect some of the complexity of the science behind the reports, as well as the reasons for consumer confusion.

In addition to the number of variables involved, by far the biggest challenge facing nutrition researchers conducting clinical trials is the difficulty in controlling people's diets completely, or for long enough to attain a measurable outcome. This makes findings more often than not, inconclusive or incomplete.

Unfortunately, journalists, aware of the public interest such findings generate, often exaggerate the importance of scientifically insignificant discoveries in an effort to create news, hence the apparently conflicting reports that pop up in the media. Shirley Beresford, a University of Washington (Seattle) epidemiologist (quoted by Bijal Trivedi in *New Scientist*, 2006: 43), sums it up like this, "Each little jigsaw piece is picked up by the media and made into a message. Maybe we shouldn't always turn our scientific findings into a message. Then people would not have the impression that nutritional advice changes every day of the week."

Genetically modified (GM) foods

Behind the debate

A discussion of natural foods would not be complete without examining the phenomenon of GM foods. Also known as transgenic foods, GM products are the latest addition to our food supply. They are plants which have been genetically engineered by removing DNA, and modifying it by inserting a new gene that contains certain desired characteristics such as pest-resistance. The modified DNA is then reinserted into the plant and, through cell division and multiplication, the new gene appears, displaying the new characteristics. This process allows scientists to modify crops genetically in a more efficient and selective manner than the traditional method of selective breeding (Collman, 2001: 34).

This method of plant breeding, however, has run into a good deal of opposition from the general public as well as environmental groups. The reasons for this are complex. First and foremost, people fear that changes to the genetic makeup of food plants could have adverse health effects, particularly an increase in food allergies and food intolerance. This fear is not entirely unfounded. One of the first transgenic foods planned for human consumption was soybeans into which a gene from a brazil nut was inserted to provide an amino acid that soybeans lack. Laboratory tests before the release of the crop revealed that people with nut allergies were also allergic to the GM soybeans. This resulted in the US seed company, Pioneer Hi-Breed International, dropping the project and publishing the results. Despite the product

never having reached the market, the outcome was not reassuring to a wary public (Pringle, 2003: 60).

Since then, public opposition has mounted, particularly in Europe and the UK where the media has dubbed GM foods “Frankenfoods” after Mary Shelley’s *Frankenstein*. While scientists appear adamant that GM food is safe, the public and the media remain sceptical and have demanded that they be given a choice in the matter. A 2001 Eurobarometer survey revealed that 94% of respondents wanted the right to choose whether to eat GM foods, while 70% were completely opposed to eating genetically engineered produce (Geary, 2003: 44). Subsequently, food producers have been forced by law to label GM food as such, and to stipulate content percentage as such.

In this instance the media have taken on the role of consumer watchdog, both shaping and reflecting the views of the general public, and through their actions, forcing government agencies to make policy changes.

Environmentalists are concerned about the possible impact that the introduction of unknown organisms can have on eco-systems and that insufficient environmental impact assessments are taking place. They fear the cross-pollination of GM plants with wild plants in the surrounds and consequently the creation of “super-weeds”, as well as the cross-pollination of GM crops with traditional crops. In addition, the indiscriminate destruction of weeds and insects using broad-spectrum herbicides and pesticides on herbicide- or pesticide-resistant crops could interrupt fragile food chains and lead to the extinction of other plants or animals that depend on them for food or pollination.

A much-publicised example of this is the Monarch Butterfly in North America, whose larvae feed on milkweed, a plant commonly found alongside corn (maize) fields. Preliminary research found the larvae susceptible to the pollen of Bt corn, a transgenic crop containing an insect-poisoning gene. The public outcry that ensued led to the conducting of additional research that ultimately determined the effect to be “negligible”. This outcome, despite determining acceptable safety levels, also served to highlight the inadequacies that exist in governments’ approval and assessment systems with regard to GM foods (Pringle, 2003: 121–140).

Many scientists originally saw GM technology as a solution to food shortages in developing countries and a way to reduce toxic chemicals in the environment. The creation of drought- and pest-resistant food crops promised to be a way to feed the hungry in poor countries, while the development of drug- and nutrient-enriched foods promised a healthier future.

Unfortunately, large corporations stepped in and bought up smaller biotech companies and their patents. This “hijacking” of intellectual property has led to the technology becoming aligned with the corporate sector, a move that has not been good news for idealists. By removing knowledge from the public domain and restricting its use with copyrights, large corporations have ensured that scientists from poorer and developing countries do not have access to the technology. In addition, poorer farmers are prevented from saving seeds from one year’s crop for the next, as the seeds of many GM crops on the market are designed to be sterile in subsequent generations. The autonomy of food producers is further jeopardised by the sale of pesticide-resistant crops and their partner trademarked pesticides (Pringle 2003: 193–203).

Thus, the promise of more sustainable agriculture and improved food security for the world’s poor has been undermined by commercial greed, with many opponents of GM crops of the opinion that these foodstuffs are being “foisted on the public by agro-chemical conglomerates interested in nothing but profit” (Geary, 2003: 45).

Only the passage of time will determine whether GM foods will ever be accepted by the general public. Despite assurances by scientists and corporations, uncertainties remain and people continue to be sceptical of these “unnatural” foods, believing – rightly or wrongly – that “once the GM genie gets out of the bottle, it’s going to be very difficult to put back in” (Mike Grenville, quoted by Geary, 2003: 45).

The science may be sound and brimming with promise but the proverbial waters have been muddied by politics and business. For many, the presence of GM foods in our food supply, the lack of transparency by biotech corporations, corporate greed and the inadequate labelling of foodstuffs containing transgenic material, are reason enough to seek out natural or organic alternatives.

As reported in the media

The media have played a significant role in bringing GM foods to the attention of the public. While many scientific findings are newsworthy, when they concern a subject as important and personal as the food we eat, they become big news. Add a bit of controversy, the potential for huge corporate profits and a “mad scientist” or two, and the audience is hooked.

GM foods, by their very nature, are controversial. The science behind them involves tinkering with the very building blocks of life – DNA. In addition, the techniques required to produce the altered organisms include cloning. For many people, this is akin to scientists

“playing God”. Numerous science fiction literature and films have been based around the idea of cloning, further contributing to people’s wary approach to this avenue of science. Given that a large portion of the public is suspicious of such science, it is hardly surprising that media sensationalism and cautionary tales have found a receptive audience.

While scientists assume that people will change their minds and agree with them on the subject of GM organisms once they are in possession of all the facts, studies into consumer behaviour reveal that, because there is emotion (fear) involved, the chances of this happening are slim. In addition, “for the majority of consumers, facts may mean less than memorable phrases” such as “Frankenfoods” and “super weeds” (Wansink, 2005: 111–120).

This does not bode well for the future of the biotech industry. But, there is an interesting rider – consumer attitudes can change if they perceive there to be more benefit involved than risk (Wansink, 2005: 118), an explanation for people’s opposition to some new technologies as well as their acceptance of others. If scientists take this into consideration and adapt their message accordingly, there is a chance that public opinion can change, or at least, mellow.

The diverse perspectives reflected by the various types of media have definitely played a role in shaping people’s attitudes to what is essentially a highly complex subject. Whichever way one looks at it, there are pros and cons – economic, social, environmental, ethical and moral. And because science cannot provide definitive answers, the subject remains contentious.

Addendum F contains two *Newsweek* articles, each reflecting opposite sides of the GM–organic debate. Both articles are written in a manner that seems to be rational and logical, and both appear to have the health of the environment and of future generations of human beings uppermost in mind. However, the solutions proposed could not be more different.

“Farm-raised pigs are dirty, smelly animals that get no respect. They're also an environmental hazard. Their manure contains phosphorus, which, when it rains, runs off into lakes and estuaries, depleting oxygen, killing fish, stimulating algae overgrowth and emitting greenhouse gases. During the 1980s, phosphorus pollution killed all aquatic life in the 42km-long Mariager Fjord of Denmark – an ecological disaster that prompted European governments to impose strict regulations on pig farming. It didn't solve the problem.” (“Why GM is Good for Us”, 2006)

Beginning with this rather repugnant description of pigs and pig farming, Article 1 enumerates the potential benefits of embracing GM organisms in agriculture. By applying the technology to subjects as diverse as pigs and trees, the author paints a picture of genetic

modification providing the solutions to the world's problems of balancing human food security with conservation of the natural environment. By increasing the efficiency of raw materials at gene-level, science is seen to offer endless possibilities and a clean and well-fed world – if people could be persuaded to accept and utilise the results.

By contrast, article 2's lead is a human interest one:

“Otto Kramm used to come home from work at night and warn his toddlers to keep their distance until he'd bathed and changed his clothes. He wasn't just trying to keep them clean. As a vegetable farmer in California's Salinas Valley, Kramm spent his days covered in pesticides, herbicides and fungicides, and he worried about their effects on young children.” (Certified Organic, 2002)

The story concludes that organic agriculture is a more earth- and people-friendly means of solving the same problems facing the world. Using illustration on a human scale in conjunction with agricultural history – and a healthy dose of realism, the piece offers an holistic approach to reducing the human ecological footprint. And it does so in a way that is neither dismissive nor romanticised, the opposite of the “brave-new-world” style of the first article.

As can be ascertained from the lead paragraphs, the journalistic techniques and the tone used in both of these articles are as dissimilar as the opinions expressed. This, in many ways, sums up the whole debate about GM organisms and organic agriculture, as well as the emotion the subject evokes.

Chapter 2

Sound science or food faddism?

The shelves of bookstores, health food shops and pharmacies are filled with books, magazines supplements and health foods all promising a better, healthier life for those that subscribe to their ideas or consume their products. But how much of what is touted is based on sound science, and how much is merely hearsay or pseudoscience?

Historical precedent

The presence of pseudoscience in the medical community is not a new phenomenon. Records of the perpetrators of fringe medicine exist from long before the days of formal qualifications. Early communities relied on the services of herbalists (usually women) and bonesetters (often the village blacksmith) to cure their ills. The quality of these healers could vary widely: some possessed real knowledge and were able to be of help, while others were charlatans of the first order.

For the most part, good healers were those who, aware that disease would run its course with or without their interference, tried only to ease the discomfort of the patient until such time as they recovered or died. Augmenting village healers were travelling hawkers who sold unguents and cures of dubious quality. Master salesmen, these intrepid characters peddled their products to unsuspecting people, promising a cure for all manner of ailments. Later referred to as mountebanks and quacks, this aspect of fringe medicine has survived and flourished into this, the twenty-first century (Maple, 1968).

The example set by these early charlatans has been followed time and again through the centuries. The audience, the products and the media may have changed, but the principle has remained the same: whether peddling unguents or pseudoscientific diet books, these people peddle hope in exchange for personal gain.

The highly technical nature of science and medicine today has led to an ever-growing knowledge gap between scientists and the medical community, and the general public. This gap is most aptly filled by those who can communicate in terms that people can understand. Unfortunately, these communicators are frequently persuasive charlatans in possession of sufficient knowledge to appear to be experts. As the saying goes, “a little knowledge is a

dangerous thing.” And a dangerous thing it is indeed if it affects the health and livelihoods of people as is so often the case in the fads and fashions of a consumer society.

The phenomenon of faddism

Food and health fads come and go at fairly regular intervals: some stay longer than others; a few of them are actually scientifically sound; many are pure nonsense and hopefully, harmless; while others contain just enough truth to be plausible. Sifting through the truths and half-truths can be a daunting task for even the informed. Thus it is hardly surprising that people are inclined to take such information at face value.

Der Marderosian and Liberti, in *Natural Product Medicine* (1988: 111), define a fad as “a silly or peculiar thing which is followed for some time with unusual or exaggerated zeal”. With the same enthusiasm shown by children when they follow trends like yo-yos, silkworms and Frisbees, adults latch onto emerging fads in various aspects of life: cars, sport, clothes, exercise, food and drugs, to name but a few.

In the current health-conscious climate, public demand for knowledge of ways to improve one’s health appears to be insatiable – if the number of publications and products available for consumption are any indication. Modern lifestyles and the associated health problems have spawned this demand for knowledge – and a whole industry of quacks and charlatans! Food and drug fads abound; as many of them spawned by celebrities as by science and pseudoscience.

All these fads develop in much the same way, often by word-of-mouth, the media or most commonly, through published literature. Citing H W Blackburn, Der Marderosian and Liberti describe the characteristics of a faddist publication as follows. The cover is brightly coloured and attention-grabbing, designed to appeal to the mass-market, rather than academics. It is written by a professional writer in collaboration with an “expert” or “authority” on the subject. The subject commonly includes a previously unheard-of or unacknowledged product (usually a foodstuff or drug) or idea (often a diet). The information is written in simple, easy-to-understand language, organised in a logical fashion. Self-diagnosis and self-medication are allowed for, frequently supported by testimonials or success stories. The authors’ credentials are often fraudulent or not appropriate for the subject matter. Credibility may be supplied via references to lesser-known institutions, incomplete research citations or quotations out of context. By piggy-backing on the reputations of acknowledged experts in this manner, the authors of fad publications achieve a certain amount of respectability. The content usually includes oversimplifications of scientific or

physiological phenomena, apparently logical constructs, and promises of a better life if the advice provided is followed. Conspiracy theories also commonly form part of the rhetoric. To complicate matters, not all the material provided in these publications is false. There is always enough truth to make the information believable. (1988: 112–113)

Examples of recent diet fads are the Hay Diet (food-combining diet), Atkins Diet (high-protein diet) and Eat Right For Your Type diet (blood-type diet), all of which have little or no scientific basis, and can, in the long term, be detrimental to one's health (Wills 1998: 202).

Case study of a diet fad: Fit for Life

The publication, *Fit for Life*, first appeared on bookshelves in the late nineteen-eighties. Promoted as a “revolutionary eating programme that lets you eat unlimited portions of the foods you like, helps you achieve *and* maintain your ideal weight, and leads you to a new level of overall health”, the book is a model faddist publication.

If we judge it against Blackburn's characteristics listed above, the results are as follows:

Is the colour brightly coloured and attention grabbing?

Yes, it has photographs of fruit and vegetables on it as well as an informal shot of the authors. The title is in bright-red uppercase letters, the authors' names in green.

Does it have mass-market appeal?

Yes. The picture of the authors adds a personal touch. The red banner announcing, “MORE THAN 4,000,000 COPIES SOLD WORLDWIDE” has definite consumer appeal for those who judge a publication by its popularity.

Did a professional writer, or a layman, write it?

Yes, the authors are a husband-and-wife team, Harvey and Marilyn Diamond. Neither uses an academic qualification in his or her title.

Are there “expert” or “authority” collaborators?

Yes. The introduction and foreword are both written by medical doctors.

Is the subject previously unheard-of?

Not really. Another well-known food-combining diet is the Hay Diet.

Is it presented in easy-to-understand language?

Yes. The authors use the first person and address the reader as “you”. Colloquial language is used throughout with many rhetorical questions, bold capitalisations, italicising, contractions and exclamation marks. There are also numerous quotes by government agencies and individuals.

Is it organised in a logical fashion?

Yes. The first part deals with “The Principles”, discussing the theories and the physiological processes involved, while the second part describes the diet itself and some recipes.

Are there testimonials or success stories?

Yes. Harvey Diamond constantly refers to his own successful dieting.

How credible are the author’s qualifications?

Not credible enough to put on the cover. He mentions in the text that he holds a nutritional science doctorate in Natural Hygiene from the American College of Health Science in Austin, Texas in the US.

What are the scientific/physiological phenomena being promoted?

The theory is based on the premise, “it’s not what you eat, but when and how”. Evidently, the body works in cycles of “appropriation”, assimilation” and “elimination”, as follows:

“noon to 8 pm – APPROPRIATION (eating and digestion)

8 pm to 4 am – ASSIMILATION (absorption and use)

4 am to noon – ELIMINATION (of body wastes and food debris)” (1987: 27).

All foods are classified on their “digestibility”; therefore the consumption of certain foods is limited to certain times of the day. In addition, foods such as proteins and carbohydrates must not be eaten at the same meal, as in combination, they are difficult to digest and lead to toxicity and weight-gain. A meal should consist of a minimum of 70 per cent water, with fruit and vegetables making up most of that. The reason for this rule is simple: human beings are made up of 70 per cent water; therefore the same proportion should also be applied to the food we eat.

What promises are made?

Harvey Diamond promises that the programme “is not a diet”, and that the results are permanent. The back cover blurb promises “hope for anyone who wants more than dead-end dieting” as well as “no calorie counting [and] no cutting of portion size”. There are also numerous references

throughout the book to the plan being “natural” (the word appears three times on the back cover alone).

Is there any hint of conspiracy?

Not that I could find. However, Harvey Diamond *does* state that the accepted recommended guidelines are wrong.

So, is this a faddist publication?

Most definitely.

Theories aside, is it safe? What does science say?

According to nutritionist Judith Wills (1998: 202), “there is no scientific evidence or reason to believe the ‘protein fights carbohydrates’ theory. Our systems can happily cope with a meal containing both protein and starch.” Besides, many fruits and vegetables contain both.

The emphasis on a diet based on fresh fruit and vegetables can do no harm. It is in fact similar to the food pyramid that forms the basis for what is regarded as a balanced diet. Weight loss is probably due to this, as well as to the consumption of unrefined starches and whole grains. Exercise is also promoted.

Why are people taken in by fads? There are several reasons for this, not least of which is that the current generation is one that has grown up in a world of half-truths (Der Marderosian & Liberti, 1988: 113) perpetuated by mass marketing, shopping channels, celebrity “worship” and spin. In addition, the messages given out by science are often conflicting, for example, several years ago margarine was considered to be a healthier option than butter; now, it transpires that margarine contains trans fat, a form of fat unnecessary in the diet, that raises LDL cholesterol and lowers HDL cholesterol,¹ thus increasing the risk of coronary disease (Cottrell, 2006: 30). High levels of trans fats have also been linked to an increased risk of women developing breast cancer (Collman, 2001: 20). The nett result of all this negative publicity about margarines, trans fats and hydrogenated vegetable fats, is that confused consumers are opting to revert to the more “natural” option of butter (“Butter churns out rise in sales”, 2005) – a case of “better the devil you know...” and a perfect example of the growing distrust of “synthetic” foods.

¹ High levels of LDL cholesterol (bad cholesterol) and low levels of HDL cholesterol (good cholesterol) have been found to increase the risk of heart disease.

The rapid rate of change over the past few decades has, without doubt, contributed significantly to the rise and fall of fads – with each new discovery come new trends and new fads. The more we discover about the human body and how it works, the more we are made aware of the ways in which we can help our bodies function optimally. This is where the various health fads come into play. Many of them are built on new, sometimes tentative, findings released by scientists and hyped by the media. Some of these ideas take root in the collective consciousness and the promotions, publications and products flow from there.

Occasionally, fads are driven by products that are the result of commercially funded research. These products are then launched with plenty of fanfare and endorsement in the media. The promotion of these products and their health benefits, in turn, generates the release of a number of like products all claiming similar benefits. An example of this is Flora Pro-Activ, a margarine made from natural chemicals derived from soybeans called plant sterols, or phytosterols, (regular margarines are made from hydrogenated vegetable oils) has been found to have LDL cholesterol-lowering properties (CSIRO, 2000).

Functional foods

A further recent health discovery that has evolved into a fad is the consumption of functional foods (Wansink, 2005: 15). Generally, these are foods whose nutritional properties have been found to have additional health benefits. They can also be natural foods to which a specific ingredient has been added to make it functional. Functional foods can be divided into categories according to which part of the body benefits from their consumption, for example: the gastrointestinal system benefits from yoghurt consumption; the skeleton from calcium-enriched milk or juice; the heart from soy; or the immune system from broccoli (Wansink, 2005: 15). Functional foods have been found to be an integral part of the full spectrum of foods consumed by humans; from everyday foods to health foods to medicine.

Functional foods are the primary selling point for a number of food products, particularly yoghurt and cereals. Some of the more well known of these are Danone's Activia (yoghurt with probiotics), Jungle Oats, ProNutro (soy-based with probiotics), All Bran Flakes (fibre), and Yakult (probiotics).

Below, in Table 2.1, is a list of examples of functional foods and their associated health benefits from Brian Wansink's² book, *Marketing Nutrition: Soy, Functional Foods, Biotechnology, and Obesity* (2005: 15).

Table 2.1: Examples of functional foods and their potential health benefits

Functional food	Key Component	Potential health benefits
Soy foods	Soy protein	Reduce cholesterol
Oats and oat-containing foods	Soluble fibre beta glucan	Reduce cholesterol
Black and green tea	Catechins	Reduce risk of cancer
Broccoli	Sulphoraphane	Reduce risk of cancer
Tomatoes and tomato products	Lycopene	Reduce risk of cancer
Fruit and vegetables	Many different phytochemicals	Reduce risk of cancer and heart
Garlic	Sulphur compounds	Reduce risk of cancer and heart
Fish	Omega-3 fatty acids	Reduce risk of heart disease
Purple grape juice	Polyphenolic compounds	Support cardiovascular function
Yoghurt and fermented dairy	Probiotics	Improve gastrointestinal health

Source: Wansink, 2005: 15

The fad of consuming functional foods is one that can have long-term health benefits for consumers – provided they stick with it, of course. It is also a fad based on sound scientific evidence, thus demonstrating that food faddism is not necessarily pseudoscience. It is merely the nature of this trend and its mass market appeal that have made it a fad.

Ultimately, functional foods are a good example of natural food that *is* good for you.

Back to nature

The whole health food industry is in essence based on the concept of food acting as drugs. Proponents of the idea that certain foods in the diet keep you healthy and can help to prevent or

² Brian Wansink is the John Dyson Professor of Marketing and of Nutritional Science at Cornell University (US), as well as director of the Cornell Food & Brand Lab.

treat certain diseases have been found by science to be correct in many instances; functional foods provide proof of this. However, there are still a number of health foods, supplements and medicines of natural origin that have no clinical effect, or are of dubious safety. The examples in Table 2.2 are a few “faddish” substances that have a longstanding reputation for improving health or treating disease if consumed in appropriate quantities.

Table 2.2: Examples of natural foods promoted as drugs

Food	Claim	Scientific evaluation
Alfalfa leaves (dried, powdered)	Nutritional supplement rich in protein, calcium, trace minerals and vitamins. Promoted as cure for diabetes.	Found to lower blood cholesterol in animals but further study required.
Bottled water	Perceived to be healthier than tap water.	Could contain high levels of sodium or other undesirable minerals. Some studies have found high levels of bacteria present. Tap water is microbially safer, although bottled water can taste better.
Bran (pericarp or outer coarse seed coat of grain)	Important dietary fibre that helps to prevent several diverticulitis-type disorders. May be useful to lower blood cholesterol May reduce risk of colonic cancer.	Cholesterol-lowering and colonic cancer reducing properties still being debated. Ingestion of large amounts can cause gut blockage and impede mineral absorption. Moderate intake advised.
Cranberry Juice	Useful in the treatment of urinary tract	Contains hippuric acid, an antimicrobial.
Lecithin (a phospholipid found in egg yolk, soybeans, milk and maize) Chemically referred to as phosphatidyl choline. Used as a stabiliser and emulsifier in food processing.	Supplementation can reduce high serum cholesterol and dissolve fatty deposits in blood vessels. Promoted uses: to eliminate liver spots, relieve arthritis pain, treat dry skin and psoriasis, and to improve memory.	Most claims untrue. Studies in progress show potential usefulness for treating hyperlipidemia, helping increase acetylcholine in brain tissue, et cetera. Reports indicate high lecithin intake can result in glycaemic index distress, salivation, excess perspiration and anorexia.
Seaweed Source of polysaccharides used as thickening agents in food industry	Alleviation of constipation, mucous colitis, et cetera. Spirulina promoted as a cure-all.	A good source of minerals, iodine and proteins but marine algae can be contaminated with heavy metals. No basis for therapeutic properties. Spirulina an expensive source of protein and vitamin B ₁₂ .

Source: *Der Marderosian & Liberti, 1988: 116–123*

An uneasy relationship

The relationship between science and popular beliefs is often an uneasy one. Scientists tend to be sceptical of unproven food and drug claims, often dismissing them outright. But, as functional food demonstrates, sometimes there is wisdom in popular beliefs. There are many foods that people have known for generations to be healthful, yet it is only in recent years that their active compounds have been isolated and their role in maintaining good health has been recognised and documented. Re-examination of known and traditional foods has, in many cases, brought to light a whole host of hitherto unknown knowledge that has changed perceptions of the role played by nutrition in good health and revealed many of the medicinal properties of food.

The role of the media in this process has been twofold: on the one hand, by exposing the public to new discoveries in nutrition science, they empower them with the knowledge to ask health care professionals the correct questions and to help them to live healthier lives; on the other, they expose the potential hazards in some of the many food and diet fads. An example of the latter is the fad that saw many people, particularly women, turning to St John's Wort as a natural anti-depressant – until it was discovered, and subsequently exposed in the media, that the herb can interfere with the absorption of the contraceptive pill (“St John's Wort warning”, 2000).

In an effort to control escalating health-care costs, medical professionals and medical aids have begun to adopt a more holistic approach to patient wellness, concentrating on self-care and preventative medicine³ as well as the treatment of disease (Cowley, Underwood & Braiker, 2002: 37–41). This revised approach to wellness has prompted some medical aids, such as Old Mutual's Oxygen and Discovery Health, to invest heavily in promoting a healthy lifestyle, to the extent that they produce their own media in the form of health/lifestyle magazines. These periodicals are filled almost exclusively with health-related articles, including updates on the latest scientific advances in medicine, sport and nutrition. And of course, they contain a number of health-related advertisements and promotional features (advertorials) too.

A further consequence of scientific investigation is that the medical community has become more aware of the relationship between nutrition and disease: the impact of diet and nutrition on the course of disease; the value of therapeutic diets; the interaction of drugs and

³ Discovery Health offers free screening benefits to its members as part of preventative care and offers rewards to members for taking part in wellness initiatives, such as Smoke-Enders and Weigh-Less, through its Vitality programme. Old Mutual offers a similar incentive plan, called Oxygen Rewards.

nutrients; and the effects of some diseases on nutrient balance in the body. Additional areas of study that have become more mainstream include the effects of megavitamin therapy on ageing and mental illness, food additives, traditional herbal remedies and toxins in foods (Der Marderosian & Liberti, 1988: 114–115).

Until recently, natural medicine was often ignored by conventional medical practice, with health care professionals frequently ill-informed about the benefits of natural products, and reputable, clinically proven, science-based information hard to come by. However, changing attitudes have resulted in ideas that were once dismissed as quackery slowly being integrated into the health system. Even medical aids have recognised the advantages of funding alternative therapies such as homeopathy and massage for their members.

Specialist health food stores are now no longer the only places where natural products can be purchased. Due to the increased scientific research into traditional medicinal products and growing public demand for natural medication, pharmacies, too, are stocking more and more of these products on their shelves. This is in essence a good thing, as pharmacists are the health care professionals best equipped to advise on the pharmacological action of both recognised drugs and herbal remedies.

For every positive aspect of food and drug faddism, however, there are several negatives. As mentioned earlier, the prevalence of pseudoscience is problematic in that it is difficult to ascertain what is factual and what is not. The lack of scientific evidence to back up claims is also a source of concern. In addition, people, often the poor, sickly and under-educated, can be taken in by the false promises of these fads and choose to forgo the potentially life-saving treatment or pain relief offered by conventional medicine (Der Marderosian & Liberti, 1988: 114).

Chapter 3

An appealing idea

If natural substances are not always good for you, why do so many people find the idea so appealing? And why are they so willing to believe it?

Initial examination of the problem suggests that people can be divided into two distinct opinion groups: those who embrace progress and all things “high tech”, viewing them as advantageous to human life; and those “back-to-nature” advocates who oppose the advances of a chemical age in favour of a Utopia that harks back to an idealistic Eden where human beings live in harmony with nature (Der Marderosian & Liberti, 1988: 111). Although these divisions certainly have merit, they are an oversimplification of a complex issue. While there are those who fit the stereotypes, there are perhaps more who fall somewhere in between – for one or more of the reasons discussed below.

A disillusioned public

The inability and unwillingness of many scientists to communicate with the public is one of the reasons for the increasing distrust of science and scientists. Most scientists appear to be incapable of disseminating information in a way that can be understood by the average person with the result that many people do not even try to keep up with advances in science and technology. While most data is available in the public domain, the majority of people lack the technical knowledge to interpret this information (Crone, 1986: 225).

The media, too, must shoulder some of the blame for this communication gap. Many journalists and reporters themselves lack the scientific and technical knowledge required to report science correctly and in a balanced manner. Amelia Genis’s 2001 study on the numerical literacy of journalists as part of a Master’s degree at Stellenbosch University discusses the importance of numeracy for journalists and, by quoting examples found in the media, highlights the pitfalls associated with innumeracy. Juanita Prinsloo (2005) (also as part of a Stellenbosch University Master’s degree) refines further on this study by examining the level of scientific literacy among South African journalists.

In addition, the time frames available to reporters do not always allow time for the in-depth research necessary. Inadequate levels of scientific literacy can further compound this time crunch. Hartz and Chappell (cited in Genis, 2001: 16) believe that reporters not proficient in

maths, statistics, probability, among other similar skills, “waste enormous amounts of time ‘just getting up to speed’ on every story they write or produce”.

Another problem affecting journalists is that newspapers are profit-driven. Hence, in order to attract attention to science and technology, it is often necessary to sensationalise issues. This, however, is counterproductive in good science journalism because, while such articles might sell newspapers, they polarise scientists and the media. The outcome thereof is that often the best sources and judges of scientific news refuse to share or interpret knowledge, which in turn, leads to substandard reporting (Crone, 1986: 238).

Another source of the distrust of science is the apparent egotism of scientists. Because the very nature of science demands proof before acceptance as fact, theories remain theories until proven to be true, or false. This means that, unless experiments have been done and results recorded and measured, a theory cannot be accepted or repudiated. While this sort of objective approach to things is laudable, it does pose a few problems in the real world. Often, people observe or experiment and, rightly or wrongly, form their own conclusions, but because no formal experiments or studies have been undertaken, scientists refuse to accept that these conclusions have any basis at all, often dismissing them as nonsense. This attitude is thus perceived as arrogance. Science’s dismissive reaction to public fears of the potential cumulative effects, over time, of small quantities of different chemicals in the body is an example of this arrogance. There is still no conclusive evidence either way, but many people are choosing rather to err on the side of caution than to accept sciences’ word on the matter (Geary, 2003: 48).

The inept handling of scientific disasters, such as thalidomide, Vioxx, and the BSE scandal in Britain, has damaged the credibility of science in the eyes of the public, leading to reassurances by scientists that substances or situations are safe being met by many with scepticism. Furthermore, the GM foods debate has led to people questioning the relationship between scientists and large corporations. The financing of research by business has, in a number of cases, compromised the integrity of the research being undertaken, and prompted many to question whose interests are best being served and whether all the pertinent information is being made available to the public. The issue of bias in favour of the sponsors has also been raised, as has the ownership of research results that could impact on public wellbeing and safety. A much-publicised example of the latter is the tobacco industry’s initial suppression of its findings that

smoking is detrimental to one's health, and more recently, the debate over the veracity of research findings into the hazards associated with passive smoking.¹

In 1994 and subsequent years, scientists' complicity in altering, not fully disclosing, and concealing results detrimental to the tobacco industry was exposed in the media. With the help of whistle-blowers such as Jeffrey S. Wigand, an ex-Vice President for Research and Development at Brown & Williamson Tobacco Company, appearing on television, the public learnt of the deliberate suppression of damning research findings as well as of studies deliberately rigged to deliver more palatable results. In addition, the role of tobacco companies in manipulating the media to downplay the health hazards associated with smoking was revealed².

Government departments and committees have not escaped public censure either with regard to science. Since these parties are often in possession of the facts long before they are communicated to the public, they have a moral responsibility to be honest and transparent where public welfare is concerned. The South African government's bungling of the HIV/AIDS pandemic made headline news around the world when President Thabo Mbeki, to widespread criticism, publicly declared that there is lack of scientific evidence of a link between HIV infection and AIDS. Subsequent actions by the Department of Health under Health Minister Manto Tshabalala-Msimang have not been encouraging either, the most infamous of these being the promotion of natural remedies like garlic and beetroot over anti-retroviral drugs.

The South African media have been instrumental in exposing the ignorance of government in the handling of the HIV/AIDS pandemic in this country, the availability of anti-retroviral treatment for AIDS suffers, and in revealing the extent of the problem to the general public. In this, journalists have often found themselves at loggerheads with government officials.

¹ A special report on this debate appeared under the headline, "Tobacco Industry Efforts Undermining Evidence Linking Secondhand Smoke With Cardiovascular Disease", in *Circulation*, the journal of the American Heart Association (Tong & Glantz, 2007).

² Documents released in 1998 as part of the settlement of the class action suit against tobacco companies in the US reveal the establishment of a public-health organisation called Arise (Associates for Research into the Science of Enjoyment). The organisation was formed in 1988 and continued until 2004. Apparently comprised of a worldwide group of scientists, the organisation set out to convince people of the health benefits of enjoying "the simple pleasures" of smoking, coffee, alcohol, et cetera. Funded predominantly by Philip Morris, British American Tobacco, RJ Reynolds and Rothmans, the group received a great deal of publicity in reputable news media including the *Independent* and *The Wall Street Journal* (Monbiot, 2006).

Business, too, has played its part in the disillusionment of the public. As mentioned above, the finance of studies by large corporations, particularly in the tobacco, pharmaceutical and biotech sectors, has sown doubt as to the veracity of such research. This, coupled with a preoccupation with profit, has drawn criticism from public interest groups, especially in the cases of genome research and the development and marketing of transgenic crops. Issues of patent- and rights-ownership are areas of concern to many, particularly those who fight for knowledge to be made available in the public domain. The Wellcome Trust, the world's largest medical charity, has been campaigning in the media for all knowledge of the human genome to be made common property so that all human beings might benefit. The ethical perspective is that it is necessary for technology and information to be made freely available to any and all researchers in order to encourage innovation and further enquiry. Such openness would be of particular benefit to developing countries where research funding is often in short supply.

The lack of access to patented technology in the biotech industry has severely hampered scientists seeking to develop modified seed varieties to help poorer countries to feed their populations. The successful introduction of golden rice, a vitamin A-enriched strain of rice, was only possible through the sponsorship of a large biotech company in possession of the appropriate patents ("What Green Revolution?", 2003).

The publicity machine that has become an integral part of government and large corporations puts a positive spin on events, data and situations – to the extent that the public is disillusioned and angry when contradicting information emerges from alternative sources. Press releases by corporations, institutions and organisations are often written in such a way as to be misleading and, when published by news media, can be mistaken for genuine news. According to Lawrence K. Altman, in the *New York Times* (2006), journals too, have been known to manipulate the media by releasing information so that it appears in the press at the same time as the issue appears on the shelves. Often the full research paper does not accompany these news releases, the result of which is that the ensuing media reports tend to reflect the journal's spin.

An unsympathetic medical profession

The medical profession has come a long way since the days when it was safer to take one's chances with infection than to visit a surgeon. Modern drugs, scientific knowledge and surgical techniques have increased our chances of surviving trauma and disease, allowing us to live longer and more productive lives.

Unfortunately, these life-savers have also created a culture of expectation where each visit to the doctor is expected to result in cure. When no cure (or prescription) is forthcoming, as is generally the case when dealing with viruses, some patients are disappointed. Consequently, doctors are inclined to prescribe unnecessary medication (often antibiotics) in an effort to appease such patients (Crone, 1986: 107). One unintended consequence of this is the creation of antibiotic-resistant strains of some diseases. Another is that patients get the impression that doctors are too quick to hand them the pills and show them the door.

The latter perception is further compounded by the fact that few medical practitioners these days have the time to really listen to patients' health problems because their time and patient loads are dictated by issues of financial profitability. This materialistic bias, coupled with the "pill-and-scalpel" mentality of modern medicine, has also led to many patients feeling that they are regarded by doctors as a machine in need of a service or part change (Nadeau, 2002: 45).

One of the downfalls of modern medicine – and one of the primary reasons that people seek out alternative therapies – is that it tends to treat the symptoms of an ailment rather than the cause, usually focusing on a part of the body rather than the whole (Der Marderosian & Liberti, 1988: ix). It is only in recent years that some medical practitioners have begun to treat the body in a more holistic manner, concentrating on total wellness and disease prevention rather than relying totally on drugs or surgery to effect a cure.

Periodicals, such as *Natural Medicine*, have tapped into this market of discontented patients by offering information on supplements and alternative therapies. However, like most other consumer magazines, advertising is the main source of revenue and articles are frequently accompanied by advertisements for associated products.

Alternative options

Frustration with orthodox medicine with its science-based approach to health care has, over the years, led to many turning to alternative therapies, which tend to be more holistic and patient-focused. Several physicians too, unhappy with the state of health care, are taking a more integrated approach to their profession, blending allopathy with alternative therapies like acupuncture and chiropractic. After scoffing at alternative medicine for over a century, the medical establishment now appears to be eager to open itself to more unorthodox forms of treatment. Scientists and researchers are currently investigating and evaluating numerous

alternative medical practices, with an eye to eventually integrating them into mainstream allopathy (Cowley, 2002: 37–39).

The realisation of the importance of nutrition in the maintenance of health and the prevention of disease has prompted more people, medical practitioners included, to become aware of the nutrient deficiencies in modern diets and to alter them accordingly. Nutritionists, such as Patrick Holford, have through media exposure, encouraged many to turn to supplements and natural foods in an attempt to achieve optimum health and to cope with the lifestyle maladies of diabetes and heart disease.

Evaluation of the risks and benefits of using natural food, herbs and supplements in combination with conventional treatments to make cancer and the treatment thereof more bearable for sufferers, and research into the effectiveness and safety of the likes of, among others, mind-body techniques and shark-cartilage supplements in the treatment of cancer, are currently underway. Preliminary studies of massage techniques, guided imagery and exercise therapy have already shown positive results in easing emotional and physical distress in cancer patients. The encouragement of active participation by patients in their treatment by alternative medicine appears to assist patients to deal with the feelings of helplessness and passivity engendered by conventional treatment (Weiger & Eisenberg, 2002: 38).

Articles in the news media and in consumer periodicals help to equip people with the knowledge to understand specific conditions and the treatments available. They also supply the information necessary for patients to question their healthcare providers about their care.

For years people have presumed that the only cures for cardiac disease are the drugs and procedures of conventional medicine. Research into the causes of heart problems has revealed that, while modern medicine has the cutting-edge tools and knowledge to treat the disease, the most effective cure is prevention. Lifestyle changes, such as reducing stress, stopping smoking, exercising, and eating properly, have been found to be the most successful means to improve cardiovascular health. In addition, consuming food naturally rich in nutrients such as folic acid, omega-3 fatty acids, vitamins E and A, and beta-carotene has been found to reduce the risks of heart disease significantly. However, there is still no conclusive proof that pill-form supplements of these substances have any effect and research continues in these areas (Haskell & Eisenberg, 2002: 39).

Scientific research into complementary and alternative medicine can only benefit humanity. By objectively evaluating therapies, scientists are finding out, not only whether they

work, but how they work and who can benefit from them. However, it is not the validation of scientific study that is the primary reason that many are drawn to seek out the alternative health care, but the humanity – the humanity and caring that is found lacking in orthodox medical practice (Cowley, 2002: 40).

Environmental concerns

Since the Industrial Revolution, the world has been experiencing a period of rapid change. Mass urbanisation, unprecedented population growth and rapid industrialisation have all left their marks on our planet. Water and air pollution, energy crises, food shortages, global warming, and plant and animal extinctions, are just some of what human beings have to face in this, the twenty-first century.

Concerns about the state of the environment are raised in the media with increasing frequency – and not without a sense of helplessness. Most thinking people have become disillusioned by the apparently slow response of government, business and science to the problem. The line between socio-economics and conservation is a fine one, and more often than not, it is the environment that comes off the loser. In areas of extreme poverty and need, the issue of conservation appears to be seen to be a privilege rather than a necessity. This is borne out by the identification of the perception that conservation is elitist and only for those that can afford it as one of the challenges facing conservation in South Africa (“World Conservation Union Meeting”, 2007).

Social issues aside, the pollution of air- and water supplies affects everyone, rich or poor, black or white. Pollution from agricultural run-off, mining, and human- and industrial waste has contaminated our water sources to the extent that rivers are no longer viable sources of drinking water, and in a country with limited supplies of fresh water, this is a serious problem. Air quality is also an area of concern; the Cape Peninsula alone has been found to have unsafe levels of air pollutants more often than not. Soil, too, has been contaminated by industrial waste and spillages, excess agricultural chemicals in the form of fertilisers, herbicides and pesticides, and human waste.

Reviewing the state of our environment, it is hardly surprising that people and the media are openly questioning the effect of these pollutants on our bodies. Comprehensive tests run on a journalist-volunteer and independently financed by *National Geographic* yielded some alarming

results – high³ levels of undesirable and dangerous chemicals were detected in the blood stream and fatty tissue (Duncan, 2006: 126). The possible health effects of these toxic chemicals range from tumour promotion and organ damage to neurological, reproductive and developmental damage.

Awareness of the dangers posed by our industrialised environment has been receiving much attention in all areas of the media. Scares making headlines in 2007 include the presence of toxic chemicals in Chinese imports, such as toys and fertiliser. Through such stories, the public has been made aware of the extent of corporate greed as well as the inadequacy of quality control measures.

Table 3.1: Toxic chemicals in everyday life

Chemical	Use	Where found	Effects	How to avoid
<i>Polybrominated diphenyl ethers (PBDEs)</i>	Flame retardant used in many products. Resists environmental degradation.	Foam mattresses and pillows, carpets and carpet padding, chair cushions, electrical appliances	Cause developmental problems in lab animals.	PBDEs are found in many appliances and some fabrics, and are unavoidable.
<i>Phthalates</i>	Chemical with a large variety of uses, from making plastics flexible to thickening lotions.	Plastic containers and bottles, nail polish, shampoo, perfume, deodorants, lotions, soap, hairspray, medicines, vinyl flooring, toothpaste, plastic toys, extension cords, some food wraps, etc.	In lab animals, they have caused problems in the sexual development of males. Recent human studies suggest that the same things might be happening to baby boys.	A few cosmetics companies have phased them out, but sources of exposure are many.
<i>Pesticides</i>	Commonly used to kill anything from cockroaches to crop fungi. Some, like DDT, are banned while others such as atrazine, are restricted.	Antimicrobial soap, pet flea collars, garden and flowers	Researchers have linked some to asthma and neurological, developmental, and immunological problems.	Wash produce well, or buy organic. In agricultural areas, limit build-up in the home by frequent vacuuming.
<i>PFAs</i> <i>These include perfluorooctane sulphonate (PFOS) and perfluorooctane acid (PFOA).</i>	Convenient but potential carcinogens that are used in scratch- and stain-resistant coatings.	Furniture fabric, non-stick pans	It takes years for the body to eliminate PFAs. High doses may cause cancer in animals.	Found in air, water and food, they are unavoidable.

³ Results were compared with Center for Disease Control (CDC) mean levels for Americans.

Polychlorinated biphenyls (PCBs)	Hard to set alight, PCBs were common coolants and insulators in electrical systems.	Contaminated fish and game, fatty meats	PCBs are slow to break down in the environment and build up in animal and human tissues. Effects include liver damage and cancer in lab animals.	Now banned, they remain pervasive. Avoid eating fish and game from areas known to be contaminated.
Dioxins	Similar in toxicity to PCBs, dioxins result from industrial activities and fires.	They enter the food chain in contaminated areas and build up in plant and animal fats. Found in fatty meats, dairy products and fish.	Disfigurement, cancer and birth defects, among others.	Avoid fatty meats and areas known to be contaminated.
Bisphenols	Polycarbonate plastics found in some rigid plastic bottles contain Bisphenol A, a synthetic oestrogen that may leak into liquids over time as the plastic degrades.	Plastic containers, lining of food cans	Researchers have found evidence in lab animals that these oestrogen mimics may cause reproductive harm to male and female fetuses.	Avoid hard plastic bottles. That may not eliminate all risk if, as some research suggests, background levels are now high enough to be harmful.
Metals	Some of the most common industrial poisons found in the home.	Old paint contains lead, fish like tuna contain mercury, pressure-treated wood contains arsenic and chromium, power plant emissions contain mercury, and vehicle emissions can contain lead.	Effects on young children range from subtle developmental delays to death. Neurological and reproductive damage.	Remove or seal up old paint and pressure-treated lumber. Pregnant women and small children should be cautious about eating certain fish, especially game fish.

Source: Adapted from Duncan, 2006: 134–135

Table 3.1 is an adaptation of a table that appeared in an article in *National Geographic* on the effects of pollutants on the human body. As indicated in the table, many toxic and health-damaging chemicals are unavoidable in the environment – whether from the modern conveniences of our day-to-day lives or from industrial and agricultural pollution. As a result of media exposés on the subject, a large number of people fear man-made chemicals because of their pervasiveness and their potentially negative impact on our bodies. Moreover, they fear that the scientists, who keep trying to reassure us of the safety of substances, are wrong. Their fears are justified. Historically, the chemical industry has a bad reputation of releasing substances now and discovering harmful health effects later (Duncan, 2006: 122).

The distances that food has to travel from source to consumer have increased as more and more of the population have become urbanised. Freshness and safety are issues of concern to producers and retailers, as well as to consumers. In an effort to satisfy consumers and reduce waste, producers and manufacturers of foodstuffs add preservatives to food. The addition of preservatives is justified if they function to prevent decay and consequently, food poisoning. However, some preservatives are added for purely cosmetic reasons, for example to make meat

appear red rather than the brownish colour that occurs on contact with air. This type of use is not justified from a health perspective and can be seen as a needless addition of chemicals to our food. Colourants, flavourants and sweeteners are also additives that are not necessary from a functional perspective (Crone, 1986: 218–219). Unfortunately, consumers have become used to the artificial flavours and extra sweetness in foods, and many have come to expect them.

Manufacturers often use chemical additives in foods to make an inferior product more palatable, and thus saleable. They also substitute cheaper ingredients for safer, more wholesome ones, then use chemical additives to mask the changes. One of the cheaper substitutes that has become common in baked goods is margarine, a substance that has subsequently been found to contain unhealthy trans fats. Nowadays it is difficult to find prepared or processed foods that are free of all but the necessary additives.

Apart from quality and taste issues, another concern that has arisen is that the overuse of additives and preservatives has led to an increase in allergies, with many people experiencing adverse reactions to additives like tartrazine and monosodium glutamate (MSG). While generally considered safe for the majority of the population, preservatives and other food additives are now required by law to be listed on labels.

Despite attempts by scientists in the food industry to convince people of the safety of additives, media reports say otherwise. An experiment aired on ITV1's *Tonight With Trevor McDonald* revealed the adverse effects of additives on children's IQ and behaviour ("Twin study reveals food additives effect", 2003). Other studies have found links between excessive MSG consumption and blindness ("Food additives 'affect sight'", 2002).

Further concerns have been raised about the presence of antibiotic and hormone residues in meat and poultry. In feedlot- and battery farming, animals are often given growth hormones to increase body weight more rapidly and thus reduce the farmers' expenditure on feed. In addition, feed is often laced with antibiotics in an effort to control disease outbreaks in pens where many animals are quartered in limited space. Residues of both the antibiotics and hormones can be found in the meat after slaughtering and these are a source of disquiet among scientists and laymen because of the potential for the creation of antibiotic-resistant bacteria. The effect that hormones in our food could have on the fragile balance of hormones within our bodies and within the bodies of growing children is also seen to be a cause for alarm (Crone, 1986: 219).

Vigilant reporting in the media has ensured that such practices have received a lot of publicity in recent years and it is to be hoped that the relevant authorities will take notice,

investigate and take steps to protect the health of the public, even if it is at the expense of big business.

Links with the past

The speed of progress in the last century has left many people floundering in a world seemingly out of control: the sheer quantity of information available is often daunting, the number of choices, overwhelming. Add to that the stress of modern lifestyles and urban living, and it is hardly surprising that people hanker for a more simple existence.

In an effort to return to a simpler way of life, many people are turning to natural food and medicine, feeling that these will give them more control over their existence. In the process, however, they are often rejecting science and progress – a case of throwing the baby out with the bath water – for no amount of wishing for the past is going to bring it back and no amount of quackery and folklore is going to make many traditional remedies safe or efficient.

The idea that it was easier and better in the past than it is now is a romanticised one. Life was tough. Food safety and food security were, literally, life-and-death issues and the modern arsenal of antibiotics and disinfectants was not available to treat illness and disease. Mother and infant mortality was high and life expectancy, generally low. Circumstances then were not unlike those in many Third World countries today.

While the environment was, on the whole, in a better condition, pollution did exist. In fact, London's Thames River is less polluted now than a century ago ("Floating down the river", 2007). Social problems were as real then as they are now, just different – and there were not as many people.

Religion and ceremony

Crone (1986: 215–223) surmises that the need people have to embrace irrational beliefs is part of a deep-seated need for religion and ceremony in their lives. Because formal religion has, in many ways been displaced by science, there is a void that needs filling (p. 215). Since logic and objectivity are too cold, this void can only be occupied by the irrational. Whereas some people attempt to fill this need by more orthodox means, others embrace a wide range of irrational fads and cults, from herbal remedies to devil-worship (p. 215).

Therefore, according to Crone, people's irrational attitudes to food and their adoption of food fads and diets are indicative of what he refers to as the "religion-substitution syndrome" (p. 215). The connection between food faddism and the religious impulse is thus the "common rejection of reason, and the shared adoption of ceremony", the ceremonial aspect here being the preparing, serving and eating of food (p. 215). Furthermore, the traditional methods of subsistence food production practiced by many back-to-nature advocates can also be viewed as part of the ceremony (p. 222).

Chapter 4

Risky business

The concept that something is good for you is intricately tied up with whether it is safe. Safety and food also go hand-in-hand, as do safety and drugs. However, in all things, food included, there is an element of risk involved, and it is up to us as individuals to evaluate the risk and weigh it up against the benefits or rewards.

The risks involved with the consumption of natural foods are varied. For some foods, the level of risk is very low, for others, quite high. The same can be said of natural medicines. The task therefore is to equip ourselves as best we can to judge whether the benefits outweigh the risks. The ease of this task is dependent on the availability of pertinent information (often found in the media) and the existence of a suitable regulatory environment.

A lack of regulation

The drug industry is a highly regulated one where testing of substances for purity, potency, efficacy and safety is a legal requirement. Drug producers are required to furnish regulatory bodies with all information pertaining to dosage, pharmacological action, ingredients, testing methods and the results thereof, as well as possible adverse reactions (*World Book Multimedia Encyclopedia*, 2002). In addition, drugs are required to be sold with package inserts listing relevant information including ingredients, dosage and potential side-effects. There is, however, no such requirement for natural medicines and health foods, these substances being classified as food supplements and thus generally regarded as safe (GRAS).

The self-regulatory environment of health foods and supplements means that manufacturers are tasked with ensuring that their products are safe and consumers therefore have no sure way of knowing how pure, effective or safe a substance is. While there are many manufacturers whose products are of excellent quality, there are those that are not as fastidious. Products manufactured under less than ideal conditions can thus be contaminated by undesirable plant material, faeces or insects. Just such a case occurred a decade or so ago when traces of lizard faeces were found in commercially produced Rooibos tea (Swanepoel, 1987), an event that shocked South Africans and resulted in the irradiation or pasteurisation of all subsequent tea.

Regulations governing health foods and supplements can vary from country to country. European regulations are generally more stringent than those in the USA, with Germany having

the most regulated natural medicine environment. Canada, too, recognises the therapeutic value of natural products and thus classifies them separately from food and conventional medicinal drugs. South Africa appears not to classify natural medicines as drugs; supplements and herbal remedies can be found on the shelves of pharmacies and health food stores as well as supermarkets.

Safety issues

Food safety is a feature of modern life that we take for granted; it is also an aspect often ignored by back-to-nature advocates. Before refrigeration, cold storage and preservatives, fresh produce and milk were often hard to come by in urban areas.

Fresh food is vital to human health. Fruit and vegetables contain vitamins and minerals that keep people healthy and safeguard them from disease, while meat and dairy produce are readily available sources of essential proteins, B-vitamins and calcium. The fresher the food, the more nutritious it is, and the lower the likelihood of spoilage due to decay, moulds and bacteria.

However, the growth of cities has resulted in the majority of people becoming further removed from the source of their food, as well as the producers of that food. Consequently, the increased distances between production and market have created a unique set of problems for producers and suppliers, the chief of which is how to maintain freshness.

Traditionally, food was kept fresh for longer by smoking or drying it, or adding salt or spices. The latter two can be regarded as early food additives, the function of which was primarily to prevent decay.

Natural food advocates oppose the use of chemical preservatives, additives, herbicides, pesticides and fungicides. This can pose some safety problems, especially in big cities where the food has had to travel long distances before reaching the shelves. As mentioned previously, even natural food can be unsafe. For, while it may be free of pesticide and herbicide residues, it can also harbour some dangerous natural toxic chemicals caused by moulds.

Another important danger associated with the consumption of natural food is the allergic potential. Many teas and herbs available at health food stores are not necessarily gathered under ideal conditions, neither are they checked for purity or uniformity of quality. Their potency and purity can thus vary considerably. Some may also contain a wide variety of potentially life-

threatening allergens including insect parts, moulds, and mould spores (Der Marderosian & Liberti, 1988: 107).

Because of the lack of regulation of natural medicines, consumers do not always get the best advice as to their uses, possible side effects and possible interactions with conventional prescription drugs. In addition, some natural medicines are contra-indicated for certain medical conditions, for example, St. John's wort (an herbal anti-depressant) lowers levels of the drug used to treat colorectal cancer (Weiger & Eisenberg, 2002: 38).

To their credit, journalists have exposed many of the dangers posed by natural substances, thus acting as an informal public protector.

The danger's in the quantity

Very often substances that are benign or beneficial in small quantities are toxic in larger and uncontrolled quantities, spices being a good example of this. This is one of the reasons that variations in potency and purity of natural remedies can be dangerous, and caution, advised.

Essentially, to quote Collman (2001: 2), "the effect of a substance – good or bad – depends on the concentration in which it is taken." It also depends on the level of exposure. For example, cyanide is present in small quantities in apple pips, but because the quantity is so small, they pose no danger to us; it would take at least one and a half cups to have a toxic effect (Der Marderosian & Liberti, 1988: 159).

Risk – what's acceptable, what's not

One of the characteristics of the modern age is the general aversion we have to risk. With every new discovery, our knowledge grows, and with it, our awareness of risk. Modern science is able to identify ever-finer degrees of risk, but is unable to give us an indication of whether the risks are reason for concern or not (Geary, 2003: 42).

As life has been made safer by the discoveries of science, technology and medicine, we have become more comfortable and subsequently more risk-averse (Geary, 2003: 44). The dangers that were a source of worry to our parents and grandparents have to a large degree been eliminated. Serious diseases like measles and smallpox, which at one time carried the risk of death, are, thanks to vaccination, no longer perceived as a threat.

This risk-aversion has a downside in that it can stifle creativity and experimentation, attributes both necessary for progress (Geary, 2003: 44). It is also problematic in that it absolves people from taking responsibility for their own health and welfare, a fact so aptly demonstrated by the culture of litigation that has arisen in the US. The media exposure of high-profile cases, which are won by the plaintiffs, unfortunately encourages subsequent litigation. The outcome of this is that people are subjected to stupid warnings on products, such as “hot when heated”, and are encouraged to blame others for their own stupidity. The most well-known case of such frivolous litigation is the “McDonalds coffee case” where a 79-year old woman sued fast-food chain McDonalds after scalding herself with coffee that she’d bought there. The case was eventually settled out of court and she was paid damages of an undisclosed amount (*Wikipedia*, 2007).

The dangers to public health posed by progress and technology are of concern to many, partly due to this risk-aversion and partly to a distrust of the new. Cellular phones, GM foods and household chemicals are potential dangers that concern the public, particularly because science and government bodies cannot tell us exactly how real the risk is. But, based on past experience with both these entities, many people are choosing to minimise their exposure to risk by informing themselves as much as possible as to the level of risk posed and by shunning developments where the levels of risk are perceived to be unacceptable (Geary, 2003: 42–49).

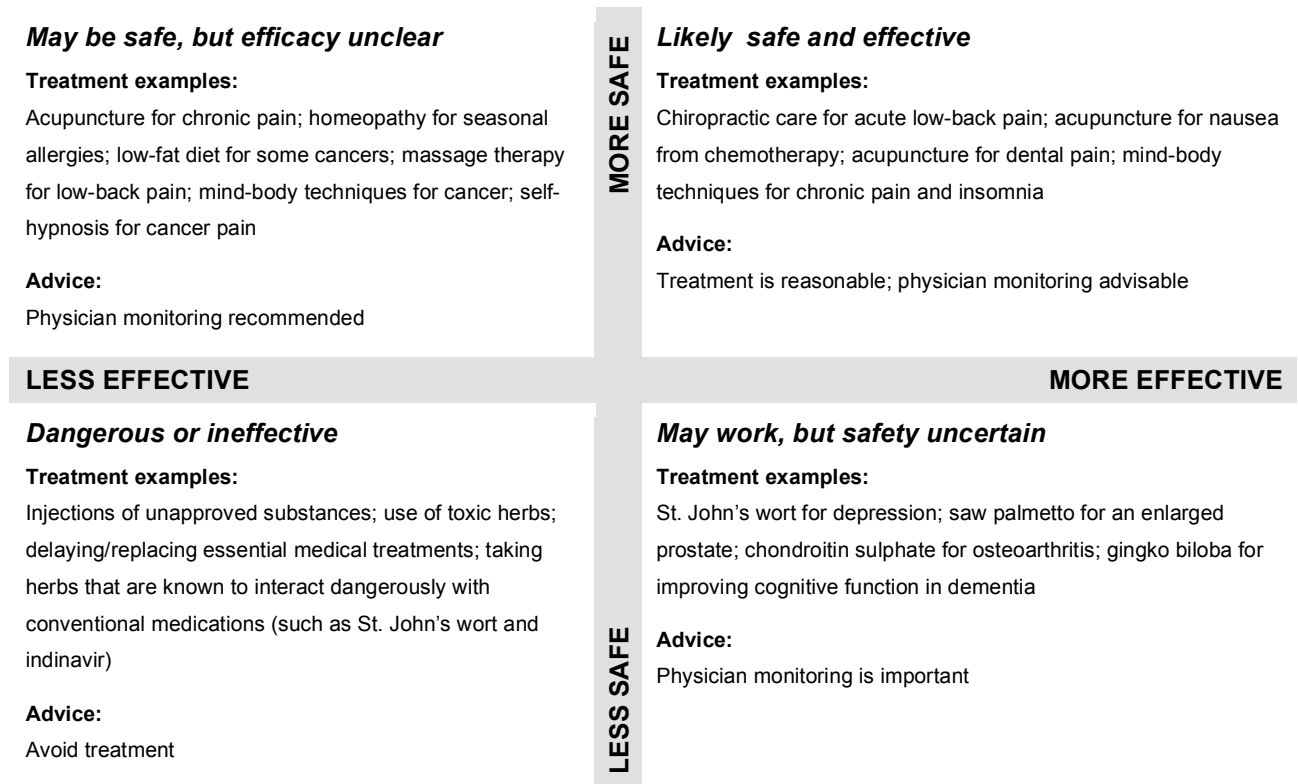
Natural products and therapies are also regarded by many in this light. The risks and benefits are weighed up and decisions made accordingly. The same goes for conventional allopathy. The most necessary requirement for good decision-making is sufficient relevant information, and it is in this respect that natural products and therapies are somewhat lacking owing to insufficient scientific study in the past.

Media reports often provide information on the degree of risk to consumers, equipping them with the knowledge to decide for themselves whether it is acceptable or not. Unfortunately, in apprising readers of risk, figures are often manipulated to create more sensational headlines. For example, a twenty-five percent risk can also be presented as a one-in-four risk, the latter being perceived to be more alarming than the former.

Figure 4.1 below is a chart that was published in *Time* magazine to inform readers of the risks versus the benefits of certain alternative therapies. Devised by medical experts to help them to gauge the risks involved in recommending alternative therapies, it can also be used by patients to help decide on treatments based on safety and effectiveness.

Figure 4.1: Risks versus benefits.

Four categories of complementary and alternative medicine, and the evidence for each:



Source: Cowley, 2002: 41

Chapter 5

Conclusions

Natural is *not* necessarily good for you – primarily because “good” and “healthy” do not always go hand-in-hand with “safe” – it is not necessarily bad either. Just because a substance is natural does not mean that it is safe. By the same token, just because a substance is artificial does not mean that it is dangerous. Nothing is completely safe; both natural and artificial chemicals can be dangerous. Furthermore, safety and effectiveness depend upon the amount of an active ingredient that is present in a substance, coupled with one’s exposure to it. Good science tells us this – and so do good media.

Language plays an important role in shaping people’s perceptions about science. Discrepancies in the terminology, usage and meaning associated with words like “natural”, “chemical” and synthetic” has led to misunderstandings between scientists and non-scientists. Furthermore, the different forms of media use language in different ways, depending on the desired outcome; words and tone can entice, cajole, scare, comfort, inflame, or outrage. Deliberately manipulating language and figures to mislead (“95% fat-free”¹ as opposed to “contains 5% fat”), sensationalise (“The supplement beta-carotene may increase the risk of bowel cancer”²) or frighten (“Vegetable ‘link’ to cancer”³) may sell more (newspapers or products), but is irresponsible and has contributed to anti-science and anti-scientist sentiment.

The natural versus chemical debate is most apparent in the current trend towards organic agriculture as opposed to GM crops and conventional agriculture. On a global scale, the issue has become more complicated than a difference of opinion about crops; the US and Europe – and their respective – supporters have ranged themselves on opposite sides on the debate. The eventual outcome will have a significant impact on the environment and food production.

Lifestyle publications and the news media have been instrumental in shaping people’s opinions on food and environmental issues. Scaremongering is a technique that appears frequently in both news reports and marketing strategy to attract attention to breaking news or

¹ Product claim on a packet of McCain’s frozen oven chips.

² Only later in the article do we find the qualifier: “The finding relates to those who smoke cigarettes and have more than one alcoholic drink a day” (*BBC News*, 2003).

³ Headline of a *BBC News* article (2002) on preliminary research linking high nitrate levels to gullet cancer.

consumer products. According to Henry H. Bauer, in his book, *Scientific literacy and the myth of the scientific method*, the media are only concerned with what he terms “frontier science”, that is, science that is still “actually being conducted. Its results have just been obtained, they are uncertain and unconfirmed” (1994: 103). In contrast to “textbook science” which is based on consensus with the knowledge “*maturely seasoned and explicated in text books* [author’s italics]”, frontier science is untried and untested by time, “*even if the experts are all or almost all agreed* [author’s italics]” (Bauer, 1994: 146).

Furthermore, according to Adelman-Grill et al. (1995), the public is more interested in frontier science than textbook science, with public policy decisions often having to be made based on insufficient scientific information. “Unfortunately, public decision making with respect to new technologies is not about textbook science but always about frontier science. And decisions cannot be postponed until present frontier science has matured into textbook science...”

Scientists’ personal interest in their work often leads to imprudence in their communication of research results to the media and the public. “[They] are intensely involved in frontier science because their emotions, their careers, their whole life depend on what they are doing. This entices many scientists to sell textbook science when they are actually talking about frontier science.” (Adelman-Grill et al., 1995).

In addition, the conflicting messages of science and pseudoscience in the public domain, as well as the lack of absolute certainty in scientific results has resulted in the public avoiding and resisting new ideas and technologies.

Historic precedence has resulted in the public regarding science, scientists and related corporations with suspicion. These attitudes of caution and scepticism, while frustrating for scientists, are understandable.

Practices and beliefs, including pseudoscience and alternative medicine, which appear to run counter to science and medicine appeal to the public for the following reasons:

- they appear to be logical and based on common sense;
- the language used is easily understood, not so highly specialised and technical as to appear incomprehensible;
- they offer an alternative to the clinical efficiency and commercialism of allopathy;
- they promise an holistic, more human-orientated, approach;

- they exhibit concern for the environment; and
- they satisfy a need for religion and ceremony.

People have generally become more risk averse as a result of the inability of science to guarantee safety, coupled with the, often sensational, portrayal of danger by the media.

The examples given in this assignment are illustrative of the trend towards more “natural living” and are but a small sample of a much larger body of evidence in the public domain.

The examination of the trend and the contributing factors bring to the fore the media’s role in informing (and misinforming) the public. In covering science and technology in the media – in particular where it concerns human health and safety – it is imperative that journalists get their facts straight and report in a fair and balanced manner. Other areas of media, too, owe it to the public to present science truthfully, and not to confuse people with half-truths and pseudoscience.

Pseudoscience is everywhere: on products, in advertisements, magazine articles and books. Most people cannot tell the difference between fact and falsehood, science and myth. An article in the *Cape Times* (2007) on a report released by British charity, Sense About Science⁴, exposes some of the lies (in the form of unsubstantiated scientific claims) fed to consumers by apparently reputable corporations, among them Clarins and Nestlé. Prompted by concerns that advertisers “are increasingly employing technical-sounding language to hoodwink consumers...[and] to generate alarm about a supposed health threat with no supporting data”, the investigation into the dubious product claims sums up the complex relationship between spin and reality that is so much a part of modern life. Interestingly, sales techniques such as these are not unlike those used by the quacks of Europe or the charlatans selling the latest potions from their wagons in the Wild West. They are also a lot like the techniques used to sell alternative (natural) medicines.

The function of the media (primarily news- and print media) as watchdog, or protector of the public is a function that has, by exposing dubious practices, frequently resulted in friction between the media, and scientists, business and government groups. Essentially, the media have been as responsible for revealing fraudulent research as for sensationalising it (Moore, 2006).

⁴ Sense About Science is a charity that provides a link between scientists and journalists *inter alia*, in an effort to improve people’s understanding of medicine and science.

Most information about health, environment and food is deemed in the public's interest, but the way in which it is released can alter public sentiment. The aim of reporting news in as balanced a manner as possible has, in some cases, had the unforeseen result of promoting fringe scientific theories by allocating them space, or time, in the media equal to that allocated to accepted science (Mooney, 2004 cited by Moore, 2006). In addition, increased competition for funding has led many scientists to seek media coverage actively, with some using the media as a means to attract attention to fringe scientific theories or fraudulent research results (Moore, 2006). According to Moore (2006), the latter is undesirable because “[b]ad science has a devastating effect on scientific communities and if it is reported in the media, it can have a devastating effect on the whole of society.”

The growing demand for information about health and wellbeing has resulted in many lifestyle reporters not necessarily having the background or the expertise to differentiate between science and pseudoscience. The outcome of this is that misunderstood ideas about natural foods, -treatments or -drugs are circulated, and people make decisions based on bad science, or a lack of scientific evidence. While there are often good reasons to make particular choices or to oppose certain practices, ideally, such decisions should be based on solid, peer-reviewed science. The media's responsibility in all this is to corroborate scientific facts with suitable experts in an appropriate field *before* presenting them to the public.

Ultimately, despite anything that the media or science might say, people are only willing to believe what they want to believe, be it myth or science. One can only hope that before making any important lifestyle decision, they equip themselves with as much credible information as they can, weigh up the issues objectively, and make their choices accordingly.

Supplement

Description of terms

Allopathy

Allopathy describes the “treatment of disease by conventional means, [that is] with drugs having effects opposite to the symptoms” (Pearsall, 1999: 36). The term is now commonly used to refer to the conventional or “established medical profession” (Der Marderosian & Liberti, 1988: viii).

Artificial

Similar in meaning to *synthetic*, *artificial* is defined as “made as a copy of something natural” (Pearsall, 1999: 76).

Biological

An adjective meaning “of or relating to biology or living organisms” (Pearsall, 1999: 135).

Chemical

The *Concise Oxford Dictionary* definition reads, “of or relating to chemistry or chemicals” and “a distinct compound or substance, especially one which has been artificially prepared or purified” (Pearsall, 1999: 242).

Chemicals

Collman (2001: 121) defines chemicals as “materials made up from the elements found in the periodic table, which is essentially a map of the elements.”

Food faddism

According to Der Marderosian & Liberti (1988), *food faddism* is the “consumption of particular foods with unusual zeal to obtain certain desired benefits.”

Functional foods

These are foods that “provide a health benefit beyond basic nutrition.” A functional food can be functional in its natural state, for example oats, or made functional by adding an ingredient, for example probiotic bacteria added to yoghurt (Wansink, 2005: 15).

Herbal

An herb is defined as “any plant with leaves, seeds, or flowers used for flavouring food, medicine, or perfume”, and herbal as “relating to or made from herbs, especially those used in cooking and medicine” (Pearsall, 1999: 664).

Health foods

Health foods are foods that are produced without the use of chemical herbicides, fertilisers and pesticides and sold without the addition of chemical flavourants, colourants, fillers and preservatives (Der Marderosian & Liberti, 1988: viii).

Healthy

Health is defined as “the state of being free from illness or injury”. Consequently, the definition of healthy is “in good health; not unwell or diseased. Promoting good health: *a healthy diet*” and “normal, natural or desirable: *a healthy attitude*” (Pearsall, 1999: 656).

Often abused by marketers and promoters in product claims, the use of *healthy*, as well as *organic* and *natural*, on food labels and in advertisements, is now regulated by some governments (Bowers, 2002).

Homeopathy

A system of medical practice pioneered in the eighteenth century by German physician Samuel Hahnemann, homeopathy is based on the idea that administering very low doses of drugs or substances that themselves produce symptoms in a healthy person can cure the same symptoms caused by disease in a sick person. For example, onions are used to treat colds because they cause crying and a runny nose (Maugh, 2002).

Media

The dictionary defines media as “the main means of mass communication (especially television, radio, and newspapers) regarded collectively.” (Pearsall, 1999: 884). When I use the term “media”, I use it in the broadest sense of the word. In more specific instances, I have chosen to refer to the different forms of mass communication as news media (television, radio, and newspapers), advertising media (advertisements, billboards, product labels and advertorials) and published media (books, magazines and periodicals).

Medicinal

An adjective meaning “having healing properties” used in relation to medicines or drugs (Pearsall, 1999: 885).

Natural

The Concise Oxford Dictionary (Pearsall, 1999: 950) defines natural as “existing in or derived from nature; not made, caused by, or processed by humankind.”

Natural food

According to *Encarta® World English Dictionary* (1999), *natural food* is “food that has been minimally processed and does not contain any additives such as preservatives or artificial coloring.”

Naturopathy

A branch of alternative medicine, naturopathy advocates healing without the use of drugs or surgery. Instead, natural remedies, such as light, heat, cold, water and fruits, are used. (Der Marderosian & Liberti, 1988: ix)

Organic food

Organic food is food that is produced without the use of synthetic fertilizers, pesticides, or drugs. Like natural foods, organic foods are additive-free, i.e., they contain neither preservatives nor colourants (Bowers, 2002).

Organic certification is based on compliance to a set of principles governing soil management, animal welfare, minimising pollution and environmental damage, and working with, rather than in opposition to, nature. Internationally accredited bodies such as Ecocert-Afrisco, SGS, BCS, Soil Association and BDOCA ensure that products carrying their stamp of approval fulfil all these requirements at every step of the production process. As yet, South African labelling laws with regard to organic produce are still pending (Younghusband, 2005).

Pharmacological

Relating to the “uses, effects and actions of drugs” (Pearsall, 1999. 1070).

Quack (quackery)

The World Book Dictionary (2002) describes a *quack* as “a person who dishonestly pretends to be a doctor”, and *quackery* as “the practices or methods of a quack”. Alternative words for *quack* are *mountebank*, or *charlatan*, descriptions that allude more to their fraudulence than to their profession. Hence, medical practitioners of dubious skill were also referred to as “mountebank quacks”. Apothecary quacks, on the other hand, were retailers of cheap drugs and generally had little or no knowledge of medicine or science (Maple, 1968. 128, 158).

Synthetic

A term used to describe anything “made by chemical synthesis, especially to imitate a natural product” (Pearsall, 1999. 1453).

Addendum A

Examples of advertisements for products incorporating “natural” in their descriptions or brand names



An advertisement for 'viridian Natural Vitamin E'. The background is teal. At the top, 'natural Vitamin E' is written in white. Below that, there are four bullet points: '• NATURAL VITAMIN E is better absorbed and utilised than synthetic Vitamin E', '• Required for the maintenance of a HEALTHY HEART & CIRCULATION', '• Viridian's Vitamin E is guaranteed NON-GM', and '• Viridian is committed to PURE INGREDIENTS'. In the center, there is a small image of a brown glass bottle of 'viridian Natural Vitamin E 330mg (400iu) 30 VEGETARIAN CAPSULES'. Below the bottle, there is a small text: 'PURCHASE - THANK YOU - CHARITY'. At the bottom left, there is contact information: 'Viridian is a family-run business, firmly rooted in the health food store, where you'll get all the advice, care and attention you deserve. Call 011 672 2612 for your nearest stockist. viridian nutrition P.O.Box2441 Florida Hills 1716 denise@viridian-nutrition.com www.viridian-nutrition.com'. At the bottom right, the 'viridian' logo is written in white, with the tagline 'Care for others as you care for yourself' below it.

An advertisement for 'FORMULE Naturelle Saw Palmetto for Men'. The background is blue and yellow. At the top, 'FORMULE Naturelle' is written in white. Below it, 'it's time to feel good' is written in white. In the center, a yellow banner reads 'MEN: What you should know about Prostate Health'. Below the banner, there is a box of 'Saw Palmetto for Men with Pumpkin Seed Oil, Zinc & Nettle Root Extract'. The box is yellow and blue. At the bottom of the box, it says 'assists in supporting the male reproductive system'.

Addendum B

Some examples of advertisements using “natural” as a selling point

Detox and Slim the natural way with Thalgo's active seaweed extracts.

Available at Camelot and other leading spas

Camelot Spas at * W. Cape: Camelot Spa at Table Bay Hotel (021) 406-8904 – Camelot Spa at Spier Estate (021) 899-1100
Camelot Spa at Caledon Casino, Hotel & Spa (029) 214-9993 * KZN: Camelot at the 'Zimbabwe Health & Beauty Spa (032) 535-1455 –
Camelot at the Selborne Hotel, Spa & Golfing Estate (039) 975-1133 – Fallaza Game Park & Spa (035) 562-2319 – Thanda Wellness Centre (035) 573-1899
* Gauteng: Camelot at the Westcliff Health Spa (011) 481-8015 – Camelot at the Planet Fitness Wanderers (011) 327-1245
Camelot at the Peak Health Club & Spa, Hyatt Hotel (011) 280-1113 – Camelot at the Hilton Executive Health Club & Spa Hilton Sandton (011) 322-1523
Mpumalanga: Camelot at the Earth Lodge and Bush Lodge at Sabi Sabi (013) 735-5261
Swaziland: Camelot at the Royal Swazi Health Spa (08288) 416-5264

Information: (011) 880-4929, (011) 880-5248; E-mail: camelotspa@mweb.co.za Web: www.camelotspas.com

PHYTO NOVA NATURAL MEDICINES

Let them fight back naturally!
...with **Phyto Nova Natural Cough and Cold Syrup**

Phyto Nova Natural Cough and Cold Syrup - as natural as your survival instinct

Phyto Nova Natural Cough and Cold Syrup was developed by experts in the field of natural medicine. It is a proven and effective solution that lets your family strike back - naturally!

- No preservatives • No alcohol
- No artificial colourants, flavourants or fragrances

Contains the following ingredients:

- **Pelargonium Root Extract** – helps fight throat and chest infections
- **Honeybush Tea & Rooibos Tea** – soothing and anti-oxidant
- **Liquorice Root & Aniseed** – immune boosting and antiseptic
- **Fennel Seed & Withania Root** – loosens congested tight chest

Fight back at throat and chest colds - with **Phyto Nova Natural Cough and Cold Syrup**.

Available at pharmacies, Dischem and health shops nationwide.

For further information, contact us at info@thebenaturalmedicines.co.za

NATURAL, EFFECTIVE RELIEF FOR THE WHOLE FAMILY!

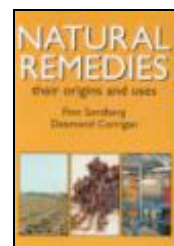
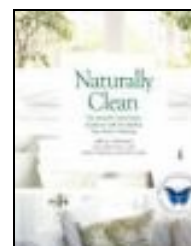
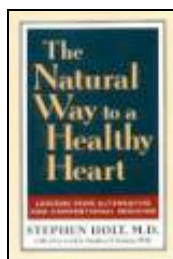
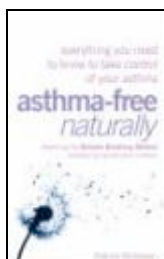
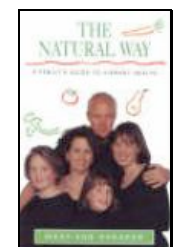
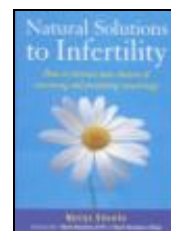
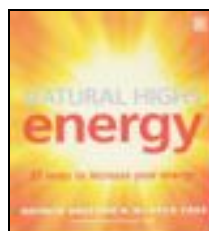
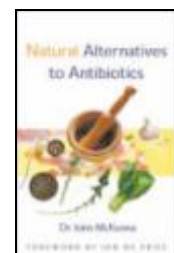
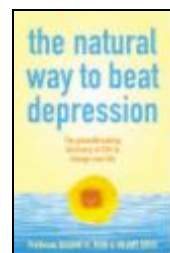
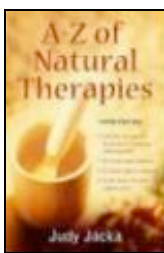
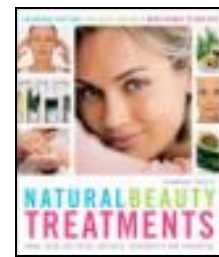
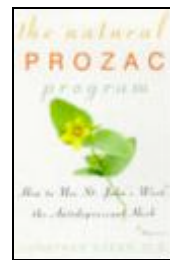
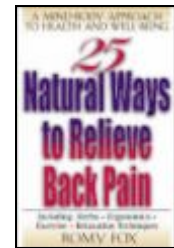
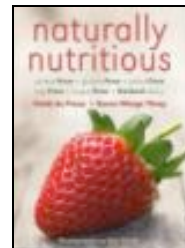
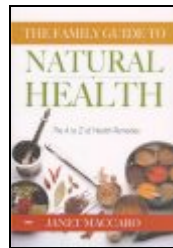
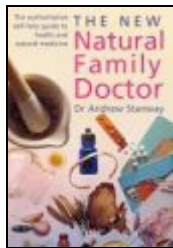
Addendum C

Some examples of cosmetics with “natural” in their names or brand names



Addendum D

Examples of some of the numerous published books containing “natural” in their titles



Addendum E

Article 1

There's not much that's special in organic wheat

If organic food really is healthier for you, it almost certainly has nothing to do with its nutritional content. A study comparing wheat grown organically and conventionally found that chemically they were virtually indistinguishable.

"Out of 55 metabolites, only five were statistically different in content," says Christian Zörb of the Federal Research Centre for Nutrition and Food in Detmold, Germany, who led the study team. "Even for those, the difference was less than double between the organic and conventional wheat, and none is known to alter taste or nutritional quality."

Zörb's team studied wheat of a single strain grown with uniform inputs, the only difference being whether the fertiliser used was organic or not. He says that this might give more reliable results than comparing items of unknown history bought from supermarkets (*Journal of Agricultural and Food Chemistry*, vol 54, p 8301).

The yields of organic wheat were 30 per cent lower, which would raise its price, though Zörb accepts that some people may be willing to pay extra for other reasons – to avoid pesticide residues, for example.

Zörb expects similar results with other crops and is now repeating the experiment with potatoes. Peter Melchett of the Soil Association, which represents organic farmers in the UK, says that the difference may be small because the crop rotation used for "conventional" wheat in the experiment was much closer to organic than usual.

From issue 2574 of New Scientist magazine, 20 October 2006, page 17
Printed on Fri Jul 06 13:19:17 BST 2007

Article 2

Organic food 'better' for heart

Organic fruit and vegetables may be better for you than conventionally grown crops, US research suggests.

A ten-year study comparing organic tomatoes with standard produce found almost double the level of flavonoids – a type of antioxidant.

Flavonoids have been shown to reduce high blood pressure, lowering the risk of heart disease and stroke.

Writing in the *Journal of Agricultural and Food Chemistry*, the team said nitrogen in the soil may be the key.

Dr Alyson Mitchell, a food chemist at the University of California, and colleagues measured the amount of two flavonoids – quercetin and kaempferol – in dried tomato samples that had been collected as part of a long-term study on agricultural methods.

These findings also confirm recent European research, which showed that organic tomatoes, peaches and processed apples all have higher nutritional quality than non-organic

– Peter Melchett, Soil Association

They found that on average they were 79% and 97% higher respectively in the organic tomatoes than in the conventionally grown fruit.

New Scientist magazine reported that the different levels of flavonoids in tomatoes are probably due to the absence of fertilisers in organic farming.

Flavonoids are produced as a defence mechanism that can be triggered by nutrient deficiency,

such as a lack of nitrogen in the soil.

The inorganic nitrogen in conventional fertiliser is easily available to plants and so, the researchers suggests, the lower levels of flavonoids are probably caused by over-fertilisation.

Conflicting evidence

Flavonoids have also been linked with reduced rates of some types of cancer and dementia. The Food Standards Agency says there is some evidence that flavonoids can help to reduce the risk of cardiovascular disease and they are currently carrying out a study to look at the health benefits in more detail.

However, a spokesperson said there was no evidence that organic food was healthier.

"Our long-standing advice on organic food is there can be some nutrient differences but it doesn't mean it's necessarily better for you."

For example, a recent study found that organic milk had higher levels of omega-3 fatty acids, but the FSA points out that these short-chain fatty acids do not seem to have the health promoting benefits offered by long-chain omega-3 oils found in oily fish.

Peter Melchett, Soil Association policy director said: "We welcome the now rapidly growing body of evidence which shows significant differences between the nutritional composition of organic and nonorganic food.

"This is the second recent American study to find significant differences between organic and nonorganic fruit.

"These findings also confirm recent European research, which showed that organic tomatoes, peaches and processed apples all have higher nutritional quality than non-organic."

"As further scientific evidence emerges from new research looking at differences between organic and non-organic food, the Soil Association will be asking the FSA to keep their nutritional advice to consumers under review."

Story from BBC NEWS: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/6272634.stm>

Published: 2007/07/05 10:54:13 GMT

© BBC MMVII

Article 3

Organic food 'no healthier'

Organic food is no safer or more nutritious than conventionally grown food, according to the chairman of the Food Standards Agency.

However, his comments have provoked protest from environmental groups.

Sir John Krebs told the BBC's *Countryfile* programme that there was no evidence that organic food was healthier than conventionally grown produce.

Sir John said the only people who got value for money from organic food were those who wanted producers to adopt more holistic farming methods.

He told the BBC: "They're not getting value for money, in my opinion and in the opinion of the Food Standards Agency, if they think they're buying food with extra nutritional quality or extra safety.

"We don't have the evidence to support those claims."

Sir John's comments contradict research carried out by the organic farming pressure group the Soil Association, which found that organic crops contain more nutrients than conventionally grown plants.

Independent tests

Independent scientific tests, commissioned by the BBC, found that conventionally grown carrots were free of pesticides.

Scientists at the Eclipse Scientific Group laboratory in Cambridgeshire extensively tested carrots that they had bought anonymously from British supermarkets.

Three types were examined for pesticide and chemical residues.

The carrots tested were: an organic British carrot, an organic carrot from abroad and a conventionally grown carrot.

The tests, for more than 40 different pesticide residues known to be associated with carrot production, were negative for all three.

Nigel Gillis of the Eclipse Scientific Group said: "I think the public will be very surprised. "Their perception of organic carrots is that they have no pesticides and conventional carrots are riddled with

them.

"We've shown with this test that that's not the case."

Sir John added: "I think the organic industry relies on image and that image is one that many consumers clearly want to sign up to.

"However, I do think they should be aware of what they're getting when they pay quite a substantial premium in the shops."

He said organic standards in the UK were extremely high but they were not necessarily applied in the rest of the world. "Much of our organic food is imported and I think consumers should be aware of that," he added.

Criticism

Harry Hadaway, Soil Association spokesman, said: "A big problem in the UK is the lack of expenditure on research into the benefits of organic food.

"This should be a prime focus for the £20m of taxpayers' money that the Food Standards Agency was given for research.

"As a historic supporter of GM foods we feel Sir John Krebs continues not to represent the wishes of British consumers, who have made it clear that they reject chemical farming and GM food due to the growing evidence of environmental and health impacts of this type of food production."

Sandra Bell, of *Friends of the Earth*, said she was "appalled" by Sir John's comments.

"Organic food avoids synthetic pesticides, the routine use of antibiotics and genetically modified ingredients. No-one knows what long term impact these may have on human health."

Ms Bell questioned why, if pesticides used in conventionally grown food were safe, did the government advise people to wash and peel vegetables before giving them to children?

"The truth is that organic food is better for people and the environment."

The full interview is broadcast on
Countryfile on BBC One at 1230
GMT/1130BST on 3 September.
<http://news.bbc.co.uk/2/hi/health/906530.stm>

Addendum F

Article 1

Why GM is Good for Us

Genetically modified foods may be greener than organic ones

NEWSWEEK

Mar 20, 2006 Issue

Farm-raised pigs are dirty, smelly animals that get no respect. They're also an environmental hazard. Their manure contains phosphorus, which, when it rains, runs off into lakes and estuaries, depleting oxygen, killing fish, stimulating algae overgrowth and emitting greenhouse gases. During the 1980s, phosphorus pollution killed all aquatic life in the 42km-long Mariager Fjord of Denmark – an ecological disaster that prompted European governments to impose strict regulations on pig farming. It didn't solve the problem.

Doing away with the pig is not an option. Pigs provide more dietary protein, more cheaply, to more people than any other animal. Northern Europe still maintains the highest pig-to-human ratio in the world (2-1 in Denmark), but East Asia is catching up. During the 1990s, pork production doubled in Vietnam and grew by 70 percent in China – along densely populated coastlines, pig density exceeds 100 animals per square kilometer. The resulting pollution is "threatening fragile coastal marine habitats including mangroves, coral reefs and sea grasses," according to a report released in February by the Food and Agriculture Organization of the United Nations.

As it turns out, there is a solution to the pig problem, but it requires a change of mind-set among environmentalists and the public. Two Canadian scientists have created a pig whose manure doesn't contain very much phosphorus at all. If this variety of pig were adopted widely, it could greatly reduce a major source of pollution. But the Enviropig, as they call it, is the product of genetic modification – which is anathema to many Westerners.

The Enviropig is one of many new technologies that are putting environmentalists and organic food proponents in a quandary: should they remain categorically opposed to genetically modified (GM) foods even at the expense of the environment? Pigs can also be modified to digest grasses and hay (as cows and sheep do), reducing the energy-intensive use of corn as pig feed. Elsewhere, trees grown for paper could be made amenable to much more efficient processing, reducing both energy usage and toxic chemical bleach in effluents from paper mills. The most significant GM applications will be ones that help alleviate the problem of agriculture, which accounts for 38 percent of the world's landmass and is crowding out natural ecosystems and species habitats. GM crops that can be produced more efficiently would allow us to return land to nature.

Standing in opposition to these advances are advocates of an organic food philosophy that holds to the simplistic notion that "natural" is good and "synthetic" is bad. Genetic modification is unacceptable to organic farmers merely because it is performed in a laboratory. Says Charles Margulis, a spokesman for Greenpeace USA, "We think the Enviropig is a Frankenpig in disguise."

Technically, however, all domesticated plants and animals were created by human selection of random mutations that occur in nature. High-energy cosmic rays break chromosomes into pieces that reattach randomly; in this way, nature sometimes creates genes that didn't previously exist. Lab work, however, is more nuanced than nature: scientists can make subtle and precise changes to an organism's DNA. Canadian biologists Cecil Forsberg and John Phillips, for instance, have constructed a novel DNA molecule that, when planted in a pig embryo, imbues the Enviropig with the ability to secrete a phosphorus-extracting enzyme in its saliva. The results so far are dramatic – the new pigs can extract all the phosphorus they need from grain alone, without the phosphorus supplements that farmers now use. This reduces the phosphorus content of their manure by up to 75 percent.

Of course, stringent testing is needed to show that a genetic modification works and that the product is not harmful to humans. Scientists can do both of these things with techniques that allow them to examine and compare the structure and activity of every one of an animal's genes. An added advantage with the Enviropig, in particular, is that the single extra enzyme in its saliva is also present naturally in billions of bacteria inhabiting the digestive tract of every normal human being, which suggests that the Enviropig will be as safe for human consumption as non-GM pigs.

Organic farmers have always boasted that their approach to agriculture is, by its very nature, better for the environment than so-called conventional farming. The European Commission states that "organic farmers use a range of techniques that help sustain ecosystems and reduce pollution." But if you think

that concern for the environment will ever persuade organic farmers to accept the Enviropig or any other animal modified to reduce pollution, you'd be wrong. According to self-imposed organic rules, precision genetic modification of any kind for any purpose is strictly forbidden. If conventional farmers begin to grow Enviropigs, organic pig farms will cause much more pollution per animal – unless environmental protection agencies step in and shut them down.

Even in the realm of health, organic food doesn't measure up to the hype. Consumers tend to assume that all organic crops are grown as advertised without chemical pesticides. This is false. Organic farmers can spray their crops with many chemicals including pyrethrin, a highly toxic pesticide, and rotenone, a potent neurotoxin recently linked to Parkinson's disease. Because these substances occur in nature – pyrethrin is produced by chrysanthemums and rotenone comes from a native Indian vine – they are deemed acceptable for use on organic farms.

In fact, although all commonly used pesticides dissipate so quickly that they pose a miniscule health risk to consumers, allergic food reactions to natural products kill hundreds of children each year. Genetically modified foods could greatly reduce this risk. U.S. Department of Agriculture scientist Eliot Herman has already created a less-allergenic soybean – an important crop for baby foods. Through genetic surgery, Herman turned off the soy gene responsible for 65 percent of allergic reactions. Not only was the modified soy less allergenic in tests but, as Herman explained, "the yield looks perfectly normal, plants develop and grow at a normal rate and they seem to have the same kinds of protein, oil and other good stuff in them." Other scientists have reported promising results in shutting off allergy-causing genes in peanuts and shrimp. Should these advances be turned into products, organic soy or peanut products will be certifiably more dangerous to human health than comparable nonorganic products.

Unfortunately, this won't happen any time soon. Because no society has ever banned allergenic foods, conventional farmers have no incentive to plant reduced-allergy seeds. And many members of the public have been led to believe that all genetic modifications create health risks. In this climate, much of the needed research isn't being pursued. Chances are, farmers will continue to grow their polluting organic pork, their allergenic organic soy and their neurotoxin-sprayed organic apples. Worse still, they will make sure that no one else gets a choice in the matter of improving the conditions of life on earth – unless, that is, others rise up and demand an alternative.

URL: <http://www.newsweek.com/id/47045>
© Newsweek Mag

Article 2

Certified Organic

Stamp Of Approval: New Government Rules Will Define 'Organic.' The Sale Of These Fruits, Veggies And Snack Foods Has Soared, But We Still Aren't Sure What Good They Do. Here's A Guide To How Purer Products Affect The Health Of Our Families And The Planet.

NEWSWEEK
Sep 30, 2002 Issue

Otto Kramm used to come home from work at night and warn his toddlers to keep their distance until he'd bathed and changed his clothes. He wasn't just trying to keep them clean. As a vegetable farmer in California's Salinas Valley, Kramm spent his days covered in pesticides, herbicides and fungicides, and he worried about their effects on young children. "I didn't know what was on my clothes," he says, "or how it might affect the kids 15 years down the road." The more he thought about it, the less he liked the feeling. So in 1996, Kramm did something radical. He bought into a farm that was being cultivated organically. "It was scary," he says. "I couldn't fall back on the tools I'd always used to fight the pests and the weeds." But he worked out a new relationship with the soil and ended up not only cleaner but more prosperous. Today Kramm has 6,000 acres on three farms. The nation's largest organic-produce distributor, Earthbound Farm, is buying up everything he can grow. And he's never off-limits to his kids.

Organic farms are still sprouts in a forest of industrial giants. They provide less than 2 percent of the nation's food supply and take up less than 1 percent of its cropland. But they're flourishing as never before. Over the past decade the market for organic food has grown by 15 to 20 percent every year – five

times faster than food sales in general. Nearly 40 percent of U.S. consumers now reach occasionally for something labeled organic, and sales are expected to top \$11 billion this year. Could dusty neighborhood co-ops sell that many wormy little apples? Well, no. That was the old organic. The new organic is all about bigger farms, heartier crops, better distribution and slicker packaging and promotion. Conglomerates as big as Heinz and General Mills are now launching or buying organic lines and selling them in mainstream supermarkets.

What exactly are consumers getting out of the deal? Until now, the definition of "organic" has varied from one state to the next, leaving shoppers to assume it means something like "way more expensive but probably better for you." Not anymore. As of Oct. 21, any food sold as organic will have to meet criteria set by the United States Department of Agriculture. The National Organic Rule – the product of 10 years' deliberation by growers, scientists and consumers – reserves the terms "100 percent organic" and "organic" (at least 95 percent) for foods produced without hormones, antibiotics, herbicides, insecticides, chemical fertilizers, genetic modification or germ-killing radiation. Food makers who document their compliance will qualify for a new USDA seal declaring their products "certified organic." "This really signifies the start of a new era," says Margaret Wittenberg of the Whole Foods supermarket chain. "From now on, consumers will get a very solid idea of what is organic and what is not."

Yet for all the clarity they provide, the standards say nothing about what's worth putting in your shopping cart. "This is not a food-safety program," says Barbara Robinson, the USDA official overseeing the effort. "We're not saying that organic food is safer or better than other kinds of food." How, then, should we read the new label? Does "certified organic" tell us anything worth knowing about a chicken breast or a candy bar? Are organically grown grapes more nutritious than conventional ones? And is organic agriculture a viable alternative to modern factory farming? These are complicated, politically charged questions, but they're questions worth asking ourselves--both as consumers and as citizens.

When the counterculture embraced organic food and farming in the early '70s, the motivation was more philosophical than practical. Maria Rodale, whose family runs the pro-organic Rodale Institute in Kutztown, Pa., sees the current boom as evidence that people are still "expressing their values about the environment and even spirituality and politics through the food choices they make." Market research suggests she's about 26 percent right. When the Hartman Group of Bellevue, Wash., surveyed consumers two years ago, only one in four cited concern about the environment as a "top motivator" for buying organic food. Flavor was a bigger concern, cited by 38 percent as reason enough to pay a premium of 15 percent or more. Sophisticated chefs have responded in droves, many now serving only fresh, seasonal food from small local growers. "The difference is huge," says Peter Hoffman, owner of New York's Restaurant Savoy and chairman of the Chefs' Collaborative. "When people taste asparagus or string beans grown in richly composted soil, they can't get over the depth and vibrancy of the flavor."

To most consumers, though, organic means healthier. Fully 66 percent of the Hartman Group's respondents cited health as a "top motivator" as will almost any shopper on the street. "Buying an apple that has poison on it, even if you wash it you don't know how much has come off," says Wendy Abrams, a suburban Chicago mother with four kids at home. Abrams buys organic milk and stocks her pantry with Newman's Own pretzels and raisins on the theory that anything organic is less likely to harbor cancer-causing chemicals. "There have been six cases of cancer on my street," she says. "It's just weird."

All of these folks – market analysts refer to them as "true naturals," "connoisseurs" and "health seekers" – seem happy with their purchases. But are they getting what they're seeking? It's hard to argue with the connoisseurs, and not just because they know what they like. A tomato grown on a vast commercial plot is bred less for taste than for durability, notes Bob Scowcroft of the nonprofit Organic Farming Research Foundation. It has to resist disease and ship well. Organic growers, with their smaller harvests and their reliance on nearby markets, can plant delicate heirloom strains and give the fruit more time on the vine. "They pick it when it's ripe," says Marion Cunningham, author of "The Fannie Farmer Cookbook." "No one goes around picking organic fruits when they're as hard as little rocks."

The health seekers may have common sense on their side, but no one has found a way to determine whether people eating well-balanced organic diets are healthier than those eating wellbalanced conventional ones. No one denies that nonorganic produce contains pesticide residues that would be toxic at high doses. Nor is there any question that children (because of their size) consume those residues in higher concentrations than adults. But there is still no evidence that pesticides cause ill health at the doses found in food, or that people who eschew them come out ahead. Technological optimists find it ludicrous that anyone would fret over pesticide residues when the hazards of foodborne bacteria are so much clearer. *E. coli* is "perhaps the deadliest risk in our modern food supply," says Dennis Avery of the Hudson Institute – "and its primary hiding place is the cattle manure with which organic farmers fertilize

food crops." So wash your produce, but don't let it scare you. Organic or conventional, fruits and vegetables are the best fuel you can put in your body.

Dangerous bacteria are even more common in animal products, but the organic program is not a germ-control initiative. Under the new guidelines, meat and dairy labeled organic must come from creatures that are raised on organic grains or grasses, given access to the outdoors and spared treatment with growth hormones and antibiotics. Experts agree that by spiking animal feed with antibiotics, conventional farmers are speeding the emergence of drug-resistant bacteria. Buying organic is one way to vote against that practice. But in terms of your own health, you'll profit more from holding back on animal products than by eating organic ones. In one study, Danish research found that organic chickens were actually more likely than conventional ones to carry campylobacter, a pathogen that can cause severe diarrhea.

So organic food is tastier and more appealing, but not demonstrably better for you. If you're shopping with only yourself in mind, maybe you'll save your money. But if you pause to think about what you're buying into with every food purchase, organic goods start to look like a bargain. Our current agricultural system took off in the years following World War II, when farmers discovered that chemical fertilizers could force higher yields out of tired soil – and that pesticides could clear croplands of competing species. As farmers saw what the new chemicals made possible, American agriculture was transformed from a rural art into a heavy industry dominated by large corporations growing single crops on vast stretches of poisoned soil.

As any ecologist might have predicted, the new approach was hard to sustain. A small, varied farm can renew itself endlessly when managed with care. Last year's bean stocks help nourish next year's cantaloupes, and a bad year for tomatoes may be a good year for eggplant. As they lost sight of those lessons, the factory farmers grew ever more dependent on chemicals. Insects died off conveniently at first. But each application of insecticide left a few hearty survivors, and within a few generations whole populations were resistant. Today, says Scowcroft, "we're applying three times as much chemical as we were 40 years ago to kill the same pests." It's not just insects. Conventional farmers now use herbicides to kill weeds, fungicides to kill fungi, rodenticides to kill field mice and gophers, avicides to kill fruit-eating birds and molluscicides to kill snails. Strawberry growers now favor all-purpose fumigants such as methyl bromide. "You inject it into the soil and put a tarp over it," says Monica Moore of the Pesticide Action Network of North America. "It kills everything from mammals to microbes. It's a complete biocide."

These practices may not be poisoning our food, but there is no question they're killing off wildlife, endangering farmworkers and degrading the soil and water that life itself depends on. Pesticides now kill 67 million American birds each year. The Mississippi River dumps enough synthetic fertilizer into the Gulf of Mexico to maintain a 60-mile-wide "dead zone" too choked with algae to support fish. And soil erosion threatens to turn much of the world's arable land into desert. "Conventional agriculture still delivers cheap, abundant food," says Fred Kirschenmann of the Leopold Center for Sustainable Agriculture in Ames, Iowa. "But when you factor in the government subsidies and the environmental costs, it gets very expensive. We're drawing down our ecological capital. At some point, the systems will start to break down."

Can organic agriculture save the day? Not if it's just a boutique alternative. But as demand grows, more and more farmers are taking a leap backward – and landing on their feet. They're discovering they can enrich the soil and manage some pests simply by rotating their crops. They're learning that they can often control insects with other insects--or lure them away from cash crops by planting things they prefer. Well-run organic farms often match conventional ones for productivity, even beat them when water is scarce. Creating a sustainable food supply may well require advanced technology as well as ecological awareness. But an organic ethic could be the very key to our survival.

URL: <http://www.newsweek.com/id/65803>

© Newsweek Mag

Bibliography

A Dictionary of Science. (4th ed.). (1999). Oxford, New York, et al.: Oxford University Press.

Adelmann-Grill, B. C. et al. (1995). *EICOS: The Unique Laboratory Experience*. Paper presented at International Federation of Science Education, Barcelona.

Altman, Lawrence K. (2006, May 2). For Science's Gatekeepers, a Credibility Gap. *New York Times* [Newspaper, selected stories online]. Retrieved 8 December 2007 from the World Wide Web: http://www.nytimes.com/2006/05/02/health/02docs.html?pagewanted=1&_r=2.

Atkins, Peter and Bowler, Ian. (2001). *Food in Society*. London: Arnold, a member of the Hodder Headline Group.

Bauer, Henry H. (1994). *Scientific Literacy and the Myth of the Scientific Method*. Urbana & Chicago: University of Illinois Press.

Bowers, Jane Anne Raymond. (2002). Health food. From the *World Book Multimedia Encyclopedia*. Chicago, Illinois: World Book, Inc.

Brahic, Catherine. (2007, July 12). Organic farming could feed the world. *NewScientist.com news service*. Retrieved 28 November 2007 from the World Wide Web: <http://environment.newscientist.com/article.ns?id=dn12245>.

Branch, Margo. (1st ed.). (2001). *Mushrooms of Southern Africa: A First Field Guide* (p. 11). Cape Town: Struik Publishers.

Butter churns out rise in sales. (2005, October 26). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/business/4378222.stm>.

Carina, Dennis. (2005, October). Viagra helps out endangered species. *News@Nature*. Retrieved 11 October 2005 from the World Wide Web: <http://www.nature.com/news>.

Certified Organic. (2002, September 30). *Newsweek*. Retrieved 7 November 2007 from the World Wide Web: <http://www.newsweek.com/id/63669>.

Claassen, George. (2006). Gesondheid uit die grond uit? *Die Burger*, 22 March 2006 [Newspaper, selected stories online]. Retrieved 28 November 2007 from the World Wide Web: <http://152.111.1.251/argief/berigte/dieburger/2006/03/22/DB/13/ORGANIES.html>.

Cohn, Victor and Cope, Lewis. (2001). *News & Numbers: A guide to reporting statistical claims and controversies in health and other fields* (2nd ed.). United States of America: Blackwell Publishing.

Collman, James P. (2001). *Naturally Dangerous: surprising facts about food, health, and the environment*. Sausalito, Calif.: University Science Books.

Commonwealth Scientific and Industrial Research Organisation (CSIRO). (2000, March 9). *Plant sterol margarine useful in cholesterol management*. Media Release – Ref 2000/68. Retrieved 29 November 2007 from the World Wide Web: <http://www.csiro.au/files/mediaRelease/mr2000/Cholesterol.htm>.

Cottrell, Justine. (2006). Trans-forming fat. *Shape*. October 2006: 30.

Cowley, Geoffrey, with Underwood, Anne and Braiker, Brian. (2002). Now, 'Integrative' Care. *Newsweek*. 2 December 2002: 37–41.

Cox, Simon. (2007, April 26). Uprooting the organic claims. *BBC News*. Retrieved 6 July 2007 from the World Wide Web: http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/magazine/6595801.stm.

Crone, Hugh D. (1986). *Chemicals & Society: A Guide to the New Chemical Age*. Cambridge: Cambridge University Press.

Der Marderosian, Ara H. & Liberti, Lawrence E. (1988). *Natural Product Medicine: A Scientific Guide to Foods, Drugs, Cosmetics*. Philadelphia, Pa.: George F. Stickley Company.

Diamond, Harvey and Marilyn. (1987). *Fit for Life*. Great Britain: Bantam Books.

Duncan, David Ewing. (2006). The pollution within. *National Geographic*. October 2006: 120–135.

Floating down the river: The River Thames – Its Pollution and Clean Up. (2007). Retrieved 9 December 2007 from the World Wide Web: <http://www.the-river-thames.co.uk/environ.htm>.

Food additives ‘affect sight’. (2002, October 23). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/health/2352709.stm>.

Geary, James. (2003). Risky Business. *Time*. 28 July 2003: 42–49.

Genis, Amelia. (2001). Numbers count: the importance of numeracy for journalists. Unpublished M.Phil mini thesis. Stellenbosch University.

Goldberg, Bob. (2000, June 5). The Hypocrisy of Organic Farmers. *AgBioView*. Retrieved 2 December 2007 from the World Wide Web: <http://www.agbioworld.org/biotech-info/articles/biotech-art/hypocrisy.html>.

Haskell, William & Eisenberg, David. (2002). Ways to Heal Your Heart. *Newsweek*. 2 December 2002: 39.

Heasman, Michael, and Mellentin, Julian. (2001). *The Functional Foods Revolution: Healthy People, Healthy Profits?* London: Earthscan.

HSBC survey [Online]. (2006). Commentary: Organic Food. Retrieved 18 October 2006 from the World Wide Web: <http://yourpointofview.com/commentaryintroduction.aspx?id=5>.

Joseph, Janna. (2005). Label lore. *Discovery*. Autumn 2005: 30–31.

Kalb, Claudia, with Springen, Karen & Underwood, Anne. (2002). How to Lift The Mind. *Newsweek*. 2 December 2002: 47–49.

Lewis, Grace Ross. (2nd ed.). (1999). *1001 Chemicals in Everyday Products*. United States of America, and Canada: John Wiley & Sons, Inc.

Local Authorities Co-ordinating Body on Trading Standards (1987). *The use of the word “natural” and its derivatives in the labelling, advertising and presentation of food: report of a survey by Local Authorities Co-ordinating Body on Trading Standards*. London: H.M.S.O.

Maple, Eric. (1968). *Magic, Medicine & Quackery*. London: Robert Hale.

Maugh, Thomas H. (2002). Homeopathy. From the *World Book Multimedia Encyclopedia*. Chicago, Illinois: World Book, Inc.

McDonald’s legal cases. (Last modified 2007, November 18). *Wikipedia, the free encyclopedia*. Retrieved 18 November 2007 from the World Wide Web: http://en.wikipedia.org/wiki/McDonald's_legal_cases#The_McDonald.27s_coffee_case_.28US.29.

Microsoft Corporation. (1999). *Encarta® World English Dictionary*. Developed for Microsoft by Bloomsbury Publishing Plc.

Miller, Michael Craig. (2002). Natural Mood Remedies. *Newsweek*. 2 December 2002: 49.

Monbiot, George. (2006, February 7). Exposed: the secret corporate funding behind health research. *The Guardian*. Retrieved 17 November 2007 from the World Wide Web: <http://www.guardian.co.uk/comment/story/0,,1703694,00.html>.

Moore, Andrew. (2006). Bad science in the headlines: Who takes responsibility when science is distorted in the mass media? *EMBO reports*, Vol. 7 no. 12: 1196–1196.

Murray, Michael. (2002). *The Pill Book Guide to Natural Medicines: Vitamins, Minerals, Nutritional Supplements, Herbs and other Natural Products*. New York: Bantam Books.

Nadeau, Barbie. (2002). Listen to Me, Doc. *Newsweek*. 2 December 2002: 45.

Organic food ‘better’ for heart. (2007, July 5). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/6272634.stm>.

Organic food ‘no healthier’. (2000, September 1). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/health/906530.stm>.

Organic food ‘proven’ healthier. (2000, January 3) *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/science/nature/588589.stm>.

Organic veg given health boost. (2002, March 13). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/health/1871676.stm>.

Palmer, John (Ed). (2000). *1001 Hints & Tips for Your Garden* (pp 75–76, 197–198). Newlands, South Africa: Heritage Publishing (Pty) Ltd, trading as Reader’s Digest, Southern Africa.

Pearce, Fred. (2002, May 30). 20-year study backs organic farming. *NewScientist.com news service*. Retrieved 28 November 2007 from the World Wide Web: <http://www.newscientist.com/article/dn2351-20year-study-backs-organic-farming.html>.

Pearsall, Judy. (Ed.). (1999). *The Concise Oxford Dictionary* (10th ed.). Oxford: Oxford University Press.

Pearson, Helen. (2004, April). Experts rethink vitamin safety. *News@Nature*. Retrieved 4 April 2004 from the World Wide Web: <http://www.nature.com/nsu/040329/040329-17.html>.

Pringle, Peter. (2003). *Food, Inc.: Mendel to Monsanto— The Promises and Perils of the Biotech Harvest*. New York: Simon & Schuster.

Prinsloo, Juanita Alida. (2006). *Worstel Joernaliste om Syfers te Ontsyfer? 'n Gevallestudie van 'n steekproef Suid-Afrikaanse joernaliste se syfervaardighede*. Unpublished M.Phil mini thesis. Stellenbosch University.

Pure food and drug laws. (2002). From the *World Book Multimedia Encyclopedia*. CD-Rom. Chicago, Illinois: World Book, Inc.

Samuel, Eugenie. (2001, April 18). Fruits of Success. *New Scientist* [Periodical, selected stories online]. Retrieved 28 November 2007 from the World Wide Web: <http://www.newscientist.com/article/dn642-fruits-of-success.html>.

Scientists expose pseudoscience in extravagant claims made by advertisers. (2007, November 20). *Cape Times*: p 3.

St John's Wort warning. (2000, March 1). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/health/662147.stm>.

Swanepoel, M. L. (1987). Salmonella isolated from rooibos tea. *South African Medical Journal* (SAMJ), Vol. 71, no. 6: 369–370.

There's not much that's special in organic wheat. (2006, October 20). *New Scientist*. Issue 2574: p 17 [Magazine, selected stories online]. Retrieved 6 July 2007 from the World Wide Web: <http://www.newscientist.com/channel/health/mg19225744.900-theres-not-much-thats-special-in-organic-wheat.html>.

The Truth Behind “The Insider”. (2007). *Campaign for Tobacco-Free Kids*. Retrieved 17 November 2007 from the World Wide Web: <http://tobaccofreekids.org/reports/insider/>.

Tong, Elisa K. and Glantz, Stanton A. (2007). Tobacco Industry Efforts Undermining Evidence Linking Secondhand Smoke With Cardiovascular Disease. *Circulation*. Issue 116: pp 1845–1854 [Journal of the American Heart Association, selected stories online]. Retrieved 17 November 2007 from the World Wide Web: <http://circ.ahajournals.org/cgi/content/full/116/16/1845>.

Trivedi, Bijal. (2006, September 23). The good, the fad and the unhealthy. *New Scientist*. Issue 2570: pp 42–49 [selected stories online]. Retrieved 6 July 2007 from the World Wide Web: <http://www.newscientist.com/channel/health/mg19125701.300-the-good-the-fad-and-the-unhealthy.html>.

Twin study reveals food additives effect. (2003, April 29). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/2984519.stm>.

Tyler, Varro E. (2nd ed.). (1987). *The New Honest Herbal: A Sensible Guide to the Use of Herbs and Related Remedies* (pp. 55–56). Philadelphia: George F. Stickley Company.

Ursell, Amanda. (2007, April 2). So, is organic food really better? *The Times*. Retrieved 29 November 2007 from the World Wide Web: http://www.timesonline.co.uk/tol/life_and_style/food_and_drink/article1599009.ece.

Vegetable ‘link’ to cancer. (2002, February 16) *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/2/hi/health/1824158.stm>.

Voting with your trolley. (2006, December 7). *The Economist*. Retrieved 2 December 2007 from the World Wide Web: http://www.economist.com/research/articlesBySubject/displaystory.cfm?subjectid=478044&story_id=8380592

Wansink, Brian. (2005). *Marketing nutrition: soy, functional foods, biotechnology and obesity*. Urbana and Chicago: University of Illinois Press.

Warning over food supplement. (2003, May 20). *BBC News*. Retrieved 6 July 2007 from the World Wide Web: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/3044319.stm>.

Weiger, Wendy & Eisenberg, David. (2002). Easing the Treatment. *Newsweek*. 2 December 2002: 38.

What Green Revolution? (2003, September 15). *Newsweek*. Retrieved 7 November 2007 from the World Wide Web: <http://www.newsweek.com/id/60031>.

Why GM is Good for Us. (2006, March 20). *Newsweek*. Retrieved 7 November 2007 from the World Wide Web: <http://www.newsweek.com/id/47045>.

Wills, Judith. (1998). *The Food Bible: The Ultimate Guide to All That's Good and Bad in the Food We Eat*. London: Quadrille Publishing Ltd.

World Book, Inc. (2002). *World Book Dictionary*. CD-Rom.

World Conservation Union Meeting. (2007, November 26). *50/50*. Retrieved 9 December 2007 from the World Wide Web: <http://www.5050.co.za/inserts.asp?ID=8079>.

Younghusband, Toni. (2005). Is it really ORGANIC? *Shape*. November 2005: 28.