

Master of Nutrition & Dietetics

S.E.S.I. (NUTD 9112)

Module 3, Summary Paper:

"Future Foods"

Farrah TATE

Nearly 2,500 years ago Hippocrates purportedly proclaimed: '*Let food be thy medicine, and medicine be thy food.*' Society is currently embracing a modern day interpretation of this tenet, with a powerful quest to formulate 'miracle' foods that are touted to: modulate the immune system, slow the aging process, influence mood, and enhance intellectual or athletic performance (Ciampa, 2000; Sheehy & Morrissey 1998). Some suggest that future designer foods will be tailored to favourably modulate individuals' genetic expression or propensities (Marriott, 2000). However, as summarised in this paper, there is much debate regarding the potential benefits and detriment to public health and environmental sustainability, that could result from the widespread production and consumption of these foods. More certain, is that dietitians will play an increasingly important role in ensuring integrity of the "future food" supply.

### What are Functional Foods? Psyllium as a Case Study...

A functional food 'delivers a health benefit beyond providing nutrients' (ADA, 1999; Preston & Lawrence, 1996). Table 1 provides some specific examples of functional chemicals in foods purported to confer physiological benefit. In general, these may be phytochemicals (of plant-origin) or zoochemicals (animal origin), or even beneficial bacteria (probiotics) and

corresponding prebiotics favouring their gut colonisation. Functional foods can constitute natural, whole or largely unprocessed foods (such as tomatoes, garlic and fish). However, more frequently, functional foods are considered those novel foods that have been heavily processed or genetically modified (GM), to remove or deactivate an allergenic component, add in a functional ingredient otherwise not present, or fortify/enrich the concentration of a functional ingredient (ADA, 1999; Sheehy & Morrissey, 1998).

**Table 1 : Selected Functional Chemicals in Foods**

Origin	Category	Specific example
Plant	Dietary Fibre	Psyllium (discussed in text)
	Carotenoids	Lycopene (tomatoes)
	Flavonoids	Flavones (fruit & vegetables)
	Sulfides/Thiols	Diallyl sulfide (onions, garlic, olives)
	Tannins	Proanthocyanidins (cranberries, cocoa)
	Phenols	Caffeic acid (fruit, vegetables, citrus)
	Plant Sterols	Stanol ester (corn, soy, wood oils, wheat)
	Soy Protein	Soy Protein (soy-beans, soy-based foods)
	Phytoestrogens	Lignans (flax, rye, vegetables)
	Animal	Omega-3 fatty acids
Conjugated linoleic acid		(Cheese, meat products)

Adapted from: ADA, 1999; IFIC, 2000a. For purported benefits, refer to ADA, 1999; Hassler, 1998.

**Table 2: Physiological benefit, corresponding health claim for and products containing psyllium**

Evidence for benefit	Permitted US Health Claim/Composition specifications	Products added to	No. serves required
<p>A recent meta-analyses by Brown <i>et al.</i>, 1999 concluded: "adding as few as three psyllium-enriched foods daily into low-fat, low cholesterol diet for individual with elevated cholesterol levels has been shown to reduce total cholesterol by 15% compared to 10% reduction for diet alone."</p> <p>This translates to an estimates additional 15% reduction in the risk of heart disease (Frankenfield 2000).</p>	<p>"When included as part of a diet low in fat &amp; cholesterol may reduce the risk of CHD by lowering blood cholesterol levels", (FDA, 1998).</p> <p>Must contain at least 1.7g per reference amount of soluble fibre from Psyllium husks.</p> <p>Must conform to dietary guidelines (regarding fat, sugar &amp; salt).</p>	<p>Kellogg's Ensemble range comprising (amongst other products) frozen entrees, bread, dry pasta, ready-to-eat cereal, baked potato crisps, frozen breakfast/desert mini-loaves, and cake and cookies.</p> <p>Functional Foods Inc. fusion products (multiple functional ingredients in powder, mixed with beverage) "Lean-on-me" &amp; Level-best"</p>	<p>4 per day (1.7 g x 4 → 7g recommended)</p> <p>2 per day (midmorning &amp; midafternoon 'snack'.</p>

A popular and scientifically substantiated functional food ingredient is Psyllium. To date the grain husks high in soluble fibre have been used to fortify many conventional foods, including the now withdrawn Kellogg's Ensemble range. Due to overwhelming evidence of the Psyllium health benefit, the US Food and Drug Administration (FDA, 1998) allowed a health claim to accompany labelling of products with specified composition (Table 2). Such health claims are the ultimate key to consumer identification of functional foods, and are an economic driver for their production (ADA, 1999).

**What is fuelling the Functional Food Trend?**

The trend has largely been fuelled by factors presented in Table 3, the most important being the permission of health claims in the US, Japan and

many European countries, including the UK. A recent US consumer survey (IFIC, 2000b) revealed that 93% of Americans believe that certain foods have health benefits that go beyond basic nutrition, and may reduce the risk of disease or other health concerns. Moreover, 65% of those ages 55 and older are already using functional foods to target a specific health concern.

Certainly, the functional food market was estimated to range from US\$10-500 billion (Corporate Watch, 2000). However, the Australian market share is some 30 times smaller (Euromonitor International, 2000). Previous proposals have been made (including ANZFA's P153) to allow health claims in Australia; food industry representatives indicate that without such approval functional food development will not progress and Australia will thus be

**Table 3: Factors Fuelling the Functional Food Trend**

<b>Factor</b>	<b>Explanation</b>
An aging population	Experiencing higher burden of disease and consequently becoming more health conscious whilst looking for quick-fix, convenience solutions that do not dispel the eating pleasures desired in later year of life.
Increased health-care costs	Most prevalent in aging Western societies. Governments are keen to reduce the health sector costs attributed to diet-related chronic illnesses; private industry financial contribution and investment towards "health-care" is welcomed.
Self-efficacy & autonomy in health-care	Current disillusionment with the health-care system and increased health consciousness has seen increased popularity for self-treatment or self-health; e-communication has fuelled this trend.
Advancing scientific evidence for the role of diet in altering disease prevalence/progression	Food & nutrition science has advanced beyond the treatment of deficiency syndromes to the reduction of disease risk and foods can no longer be evaluated only in terms of macronutrient and micronutrient intake.
Increasing sophistication of food technologies	Scientists/industry are utilising advanced processing/biotechnology to recombine/add/remove chemicals/DNA from various sources into palatable & acceptable novel foods.
Changes in food regulation	Permitted health claims are the economic engine that drives functional food development/production, & increase consumer awareness/interest.

Adapted from ADA, 1999; Hasler 1996; IndustrySearch, 2000; Lawrence & Germov, 1999; Reilly, 1994; and Sheehy & Morrissey, 1998.

discriminated against in a rapidly evolving international market (AFC, 1998; Jefferson, 2000; Panasiak, 1999).

### How do functional foods fit within an ecological model of food & health?

There is significant debate regarding whether the introduction of functional foods (and particularly GM foods) will bring long-term health and environmental benefit or detriment; summary points for the potential benefits and disadvantages of functional foods are provided below in Table 4. It is

plainly evident that currently there is as much passionate idealism of opinion as there is substantiative evidence for either side of the debate.

### Increasing or decreasing inequities in health/disease outcome?

Previous US economic analysis has shown significant benefit of functional foods and their respective health claims, towards reducing health care system expenditure (Lawrence & Germov, 1999). However, it must be acknowledged that this exercise was confined to the medical paradigm, as opposed to the socio-environmental paradigm of health (compared in Table 5).

**Table 4: An out-line of possible advantages & disadvantages of functional foods**

	Potential Benefits	Potential Disadvantages
Public Health	<ul style="list-style-type: none"> <li>Provide a positive, health promotion message</li> <li>Can provide cost-effective nutrition education that is <i>visible</i> to all sectors of society in the supermarkets.</li> <li>May be a realistic, convenient &amp; appealing way to facilitate <i>healthier</i> eating habits</li> <li>May provide a unique marketing opportunity to promote fruit &amp; vegetables</li> <li>Have the <i>potential</i> to reduce health care system costs &amp; public sector spending</li> <li>Provides the food industry with an incentive to produce foods with a nutritional advantage</li> <li>Encourage nutrition research</li> <li>Allows for health self-action desired by many of those currently disillusioned with the traditional health care system</li> </ul>	<ul style="list-style-type: none"> <li>May fixate consumer anxiety on disease risk rather than health outcome, &amp; teach people how to prevent/treat a specific disease but not how to achieve optimal overall life-style health outcomes.</li> <li>Concentrated marketing of heavily processed functional foods may decrease consumption of unprocessed plant foods, and decrease overall dietary variety.</li> <li>May increase inequities in access to health in the marginalised groups who need it the most, due to value-added premium pricing to cover research, production &amp; advertising costs</li> <li>Related to the above, the target market is affluent first world consumers who have less need than 3<sup>rd</sup> world consumers who cannot afford these products.</li> <li>The long-term consequences are unknown, as toxicology studies on animals &amp; environmental trials are only short-term.</li> </ul>
Environmental/ Ecological sustainability	<ul style="list-style-type: none"> <li>GM crops may have the potential to increase ecological sustainability by                             <ul style="list-style-type: none"> <li>Decreasing the intensity of current land-use, through growing crops on previously inaccessible land (arid, saline, cold &amp; frost-susceptible regions)</li> <li>Increasing yields/hectare of land use (enhanced insect/pest resistance, enhancing growth, etc)</li> <li>Reducing chemical application to crops (insect/pest resistance genes, eventual purported N-fixation).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Possible 'genetic pollution' by GM foods, including the potential for:                             <ul style="list-style-type: none"> <li>Cross-pollination of GM crops with wild crops,</li> <li>Out competition of unmodified animal/plants, reducing genetic diversity</li> <li>Transferral of antibiotic resistance genes to other organisms including gut bacteria, insect pests and weeds</li> <li>Increased herbicide use associated with tolerant crops (making up a large proportion of those currently grown).</li> </ul> </li> <li>Considerable "food miles" &amp; energy cost are associated with production &amp; distribution.</li> <li>Potential for large-agribusinesses to monopolise the food supply &amp; decrease local food production sustainability.</li> </ul>

Adapted from: AFC, 1998; Clunies-Ross & Hildyard 1992; Corporate Watch, 2000; Reilly, 1994; Stanton, 1999; Unklesby, 1992.

Related to this, several flawed assumptions were made, including that consumers will be able to read and understand health claims, and then be motivated and have the capacity to change their behaviour (IFIC 2000a; Lawrence & Germov 1999). However, it is likely to be the very same people

who have the highest burden of poor health, who also have lower education levels, and considerable obstacles to food choice through their social, economic and cultural life circumstances (Lawrence & Germov, 1999). As functional food products are a premium priced, individualised and medicalised

intervention, their widespread infiltration of the food supply may increase inequities in health outcome within sectors of, and even between, nations

**Table 5: Comparison of socio-environmental & medical paradigms of health:**

	Health promotion paradigm	Medical paradigm
<b>Scope</b>	Population	Individuals
<b>Health</b>	Population resource for living	Absence of disease
<b>Food</b>	Prerequisite for health	Product to help prevent/ treat disease
<b>Cause ill health</b>	Socioeconomic circumstances	Individual's behaviour & biology

Adapted from: Lawrence & Germov, 1999.

(Lawrence & Germov, 1999; Sheehy & Morrissey, 1998; Sunley, 1999).

However, proponents of functional foods and their corresponding health claims believe that their prohibition actually increases health inequities in Western societies, as only the affluent and educated individuals have access to, and the ability to understand, scientific literature describing benefits of functional foods (Williams 1998). Additionally, in 3<sup>rd</sup> world nations GM food crops in particular (such as the Vitamin A enriched "Golden Rice", touted to prevent blindness and disease) have been proposed as the ultimate solution for feeding millions of starving people (Corporate Watch 2000). Yet, poorer

nations cannot afford to sustain the production of, let alone pay to consume, these foods and as Rosemary Stanton (1999) points out: "There is already enough food produced in the world; its uneven distribution is the problem."

**Helping or hindering ecological sustainability?**

Debate is also rife over the potential for functional foods to either compromise or enhance the integrity and sustainability of environmental resources, as specified in Table 4. In a broader context, the crux of this debate resides within a current climate of opposing driving forces: the short-term economic benefits from the politically and industrially supported concept of economic rationalism and free trade, versus the long-term benefits of ecological sustainability. The outcome has thus far been that short-term profit is placed as a priority before long-term consideration of public/environmental health, with the food supply (both trade and composition aspects thereof) experiencing significant policy deregulation.

As an example of such competing interests, The Food for the Future Council & Primary Industries & Resources SA are reputedly committed to "ecologically sustainable development" (FFC, 2000; PIRSA, 1999). Yet, they also have industry targets of \$15 billion (by 2010), including increased



production of heavily processed, value added foods (including functional foods) from 32% share of the food industry (1996/97) to 50% by the year 2010 (FFC, 2000). It remains to be seen how both of these targets can be simultaneously achieved, but of course, such consideration is a necessary objective for our nation and others.

Concerns that functional foods will increase the trend of globalisation of and a capitalist approach to, the food supply appear to be well founded. There have been increases in market/expert co-operatives between scientists and food manufacturers, and a further increase in cross-state or even international giant agribusinesses (Corporate Watch, 2000; Stanton, 1999). These corporations have the enormous economies of scale needed to increase the profit to technology cost margin. Hence they have the capacity to out produce and advertise other companies, particularly small local producers, thus exerting significant control over the food supply and potentially adversely impacting on local sustainability (Corporate Watch, 2000).

## **Responsibilities of dietitians/nutritionists & other key players in relation to functional foods**

*The American Dietitians Association position statement on functional foods* (Appendix 1) lists a comprehensive set of responsibilities also relevant to dietitians in other Westernised countries. Dietitians have enormous expertise to contribute towards functional food research, consumer education, advising industry to ensure standards of composition and safety are not compromised, and advocating for a government regulatory environment consistent with public health rather than food industry profit (Preston & Lawrence, 1996). The latter particularly pertains to future health claims on food labels and advertisements. Australia should aim not to replicate the misfortunes of the US, where products exhibiting outrageous, misleading and largely scientifically unsubstantiated claims have been released onto the market (Table 6).

Additionally, it is important for health professionals, food industries, and the government to endorse the Dietary Guidelines (Appendix 2), with respect to functional food composition and importantly, consumer education. Consumers need to be made aware that these foods *may* bring benefits, but only in the overall scheme of a healthy, varied diet and appropriate lifestyle

**Table 6: Previous functional food products marketed in the US**

<b>Product name</b>	<b>Contains</b>	<b>Claim</b>
Immune Boon	Echinacea	"This herbal tonic enhances and bolsters the body's defense system."
Mental Refresher	Gotu kola, ginkgo biloba, ginseng	"Helps support mental clarity and healthy brain function." "A mind-supporting tonic."
Relaxation Cocktail	Kava kava	"Enhances relaxation and promotes tranquil well-being."
Oh, Happy Day	St. John's Wort	"With St. John's wort added in to lift the spirits."
Super Juice	Echinacea	"Contains echinacea... a defender of your health... keep Mr. Cold at bay."
Intelli•ox Juice	Ginkgo, ginseng	"Boosts both mind and body... to promote circulation to the brain and to maintain a plentiful blood flow to the central nervous system..."
Immune•ox Juice	Echinacea, purplea	"May help stimulate the body's production of interferon, a cell protecting protein."
Echinacea Shells	Echinacea	"Facilitates the healing process and is used as a blood purifier and can be an effective antibiotic."
Personality Puffs	St John's Wort, ginko biloba	"This 100% natural blend has been specifically designed to balance your Personality."

Adapted from: CSPT, 1999

determinants, including physical activity (ADA, 1999; Sheehy & Morrissey, 1998). I also believe the government and industries involved in functional food regulation and production, respectively, must implement equitable pricing policies for their foods, relating to concerns of accessibility, as previously addressed. Government endorsed food and nutrition policy has thus far failed to adequately address issues surrounding ecological sustainability (Carter P, 2001, *pers. comm.*). Dietitians, with their community, should advocate for

policy and infrastructure favourably supportive of local 'functional' food production (largely unprocessed plant foods, such as fresh fruit and vegetables), in keeping with the concept of ecological sustainability.

When considering the potential benefits and disadvantages of functional foods, dietitians, government regulatory bodies and interested others must be objective but critical, and consider each product by independent case.

Dietitians must ask: is there scientific substantiation for the product and what does the science really mean, in an overall broad context of both social and medical determinants of public health? In relation to this, some questions that health professionals may pose to evaluate functional foods are provided in Table 7. Such an examination of the Psyllium Ensemble range (now withdrawn) reveals that even a scientifically substantiated functional food ingredient may not be as functional as first thought (Table 7).

It is important to consider potential food safety issues; there have thus far been reports of allergy, toxicity, drug interference and drowsiness, particularly associated with herbal-based products (such as those in Table 5) and less so with the excessive consumption of nutrient fortified products (Ciampa, 1999 & 2000). Furthermore, the long-term effects of consumption of genetically modified and other functional foods are currently unknown. I



believe that regulatory bodies such as ANZFA should take a more cautious approach to novel foods, particularly GM foods, by establishing a moratorium until the *actual* long-term effects on human and ecosystem health can be determined.

### Conclusion

Functional or Dysfunctional Foods? Do these foods have the potential to promote or compromise public health and environmental/ecological sustainability? You must be the judge. However, one thing is clear: it is unreasonable and unrealistic to expect technological interventions such as

functional foods & crops to 'solve' complex social and environmental problems. Additionally, though seemingly simplistic Rosemary Stanton's comment "We don't (yet) know, what we don't know" must be borne in mind when considering the long-term environmental and public health impact, particularly of genetically modified foods. However, continued food policy deregulation and an increased trend to globalisation of the food supply, suggests that such a cautious approach is currently being substituted for short-term profit gains.

Certainly, functional foods have potential benefits and whether functional foods prove to be a boon or mere quackery will in part depend upon

**Table 7: Functional Food Considerations for Health Professionals (including dietitians) & Other Interested Parties**

<b>Corresponding analysis of the Kellogg's Ensemble range</b>	
<b>Consideration</b>	
- How applicable are the findings of medical research from trials on individuals to the general population?	The desirability for the consumption of 7g/day of psyllium by the entire population is questionable, as research was conducted on middle-aged hypercholesterolaemic men. Can we safely extrapolate to other groups, such as healthy children and women?
- Is there enough of the functional ingredient? How many serves of the food are needed to achieve the desired outcome? How realistic or expensive is this to achieve?	These products may not be realistically accessible for all consumers, as at least four servings of one, or different, premium-priced products would need to be consumed per day, every day, to achieve physiologically beneficial intake.
- What are the <i>potential</i> /food safety issues?	Possible fat/fat-soluble vitamin malabsorption with excessive consumption, particularly a concern for children. Other safety issues unrelated to Psyllium discussed further in text.
- Is the overall food composition consistent with dietary guidelines? How can industries interpret & exploit our nutrition messages?	Unfortunately, many of the products were inconsistent with the US dietary guidelines. For example, their Psyllium cake was too high in fat to carry the permitted health claim (Table 2). However, the permitted structure-function claim of "Promotes heart health" is virtually indistinguishable and potentially confusing for consumers. This is clearly a blatant exploitation of dietitian's health messages and consumer's desire to respond to these messages.

Adapted from: ADA, 1999; Brophy & Schardt, 1999; Corporate Watch, 2000; Panasiak, 1999; Preston & Lawrence, 1996.

public health professionals and dietitians, who can positively influence the food supply & ensure consumers are not exploited. A pertinent question to ask is: do we actually need to 'fix' the food supply, other than addressing inequities of access? Related to this, a final important point is that we should not let functional foods become a substitute for our inability, thus far, to attractively market the concept of a diet rich in unrefined plant foods... that is, a diet consisting of nature's functional foods.

Word Count: 1724

### References:

- American Dietetics Association, 1999. Functional foods -- Position of ADA. *Journal of the American Dietetics Association* 99: 1278-85. [Accessed online 25-05-01: [www.eatright.org/adap1099copy.html](http://www.eatright.org/adap1099copy.html)]
- Australian Food Council 1998. *Food Fights Disease -- Health Messages the Go!* [Accessed online 28-05-01: [www.afgc.org.au/documents/mr020\\_98.htm](http://www.afgc.org.au/documents/mr020_98.htm)]
- Brophy B & Schardt, 1999. Functional Foods. *Nutrition Action Healthletter*. CSPI: USA [Accessed online 25-05-01: [www.cspinet.org/nah/4\\_99/functional\\_foods.htm](http://www.cspinet.org/nah/4_99/functional_foods.htm)]
- Brown L, Rosner B, Willett W, Sacks F, 1999. Cholesterol-lowering effects of dietary fiber: a meta-analysis. *American Journal of Clinical Nutrition* 69: 30-42.
- Ciampa L, 1999. Nutraceuticals lead wave of new food research. CNN food central: USA. [Accessed online 25-05-01: [www.cnn.com/FOOD/news/9910/20/functional.food/index.html](http://www.cnn.com/FOOD/news/9910/20/functional.food/index.html)]
- Ciampa L, 2000. Are 'functional foods' dangerous? CNN food central. [Accessed online 25-05-01: [www.cnn.com/2000/HEALTH/alternative/07/18/herbal.foods/](http://www.cnn.com/2000/HEALTH/alternative/07/18/herbal.foods/)]
- Clunies-Ross T & Hildyard N, 1992. 'The Real Agenda: GATT and Biotechnology. Ch 7 in: *The politics of industrial agriculture*. Earthscan Publications Ltd, London.

- Consumer Science for Public Interest (CSPI) 1999. *Functional Foods Named in the CSPI's Complaints to the FDA*. [Accessed online 25-05-01: [www.cspinet.org/reports/funcfoodcomplaint.htm](http://www.cspinet.org/reports/funcfoodcomplaint.htm)]
- Corporate Watch, 2000. The industry strikes back. Functional Foods: Good for Monsanto's Health. [Accessed online 25-05-01: [www.gm-info.org.uk/gm-info/briefings/funcfoods.pdf](http://www.gm-info.org.uk/gm-info/briefings/funcfoods.pdf)]
- Euromonitor International, 2000. *Functional Foods: A World Survey*. [Accessed online 25-05-01: [www.euromonitor.com/pdf/FunctionalFoods.pdf](http://www.euromonitor.com/pdf/FunctionalFoods.pdf)]
- Food and Drug Administration (US), 1998. *FDA Talk Paper February 17<sup>th</sup>, 1998*. [Accessed online 25-05-01: <http://www.fda.gov/bbs/topics/ANSWERS/ANS00850.html>]
- Food For the Future Council, 2000. *Food Plan - towards 2010*, [Accessed on-line 07-05-2001: [www.food.sa.gov.au/](http://www.food.sa.gov.au/)]
- Frankenfield G, 2000. Fiber in Oats and Beans Helps Lower Cholesterol. *WebMD News, February* 4. [Accessed On-line 25-05-01: <http://my.webmd.com/content/article/1728.54877>]
- Hasler C, 1998. Functional Foods: Their Role in Disease Prevention and Health Promotion. A publication of the Institute of Food Technologists Expert Panel on Food Safety and Nutrition. *Food Technology* 52(11): 63-70. [Accessed online 25-05-01: [www.ift.org/resource/pdf\\_files/funcfood.pdf](http://www.ift.org/resource/pdf_files/funcfood.pdf)]
- Hasler C, 1996. Functional Foods: The Western Perspective. *Nutrition Reviews* 54(11): S6-10
- International Food Council Information Foundation 2000a, Background on Functional Foods. [Accessed online 25-05-01: <http://ific.org/relatives/17180.PDF>]
- International Food Council Information Foundation 2000b, Functional Foods: Attitudinal Research. [Accessed online 25-05-01: <http://ific.org/relatives/17260.PDF>]
- IndustrySearch, 2000. Functional Foods: Why the consumer can't get enough. [Accessed online 25-05-01: [www.industrysearch.com.au/features/functional.asp](http://www.industrysearch.com.au/features/functional.asp)]
- Jeffreson S, 2000. Health Claims -- their history and future. *Food Chain (SIGNAL)* 2: 1&12. [Accessed online 25-05-01: <http://www.dhs.vic.gov.au/nphp/signal/fchain.htm>]
- Lawrence M & Germov J, 1999. 'Future Foods: The Politics of Functional Foods & Health Claims' in: Germov J & Williams L (ed), 1999. *A Sociology of Food & Nutrition: The Social Appetite*. Oxford University Press, Victoria.
- Marriott B, 2000. Functional foods: an ecological perspective. *American Journal of Clinical Nutrition* 71(suppl):1728-34S
- NHMRC, 1992. Dietary Guidelines For Australians. AGPS, Canberra
- Panasiak D, 1999. *Presentation to Nutrients and Fortified Foods, 18-20 August 1999*. [Accessed on-line 25-05-01: [www.foodliaison.com.au/articles/fortified\\_foods.pdf](http://www.foodliaison.com.au/articles/fortified_foods.pdf)]

Primary Industries and Resources S.A., 1999. Environmental Policy. [Accessed online, 07-05-01 : [www.pir.sa.gov.au/pages/showcase/environmentalpolicy.htm](http://www.pir.sa.gov.au/pages/showcase/environmentalpolicy.htm)]

Preston C & Lawrence M 1996. Regulatory and Legal Aspects of Functional Foods: The Australian Perspective. *Nutrition Reviews* 54(11): 5156-61.

Reilly Conor, 1994. Functional foods -- a challenge for consumers. *Trends in Food Science & Technology* 5: 121-3.

Sheehy P & Morrissey P, 1998. 'Functional Foods: Prospects & Perspectives' (chapter 3) in: Henry C & Heppell N (eds) *Nutritional Aspects of Food Processing and Ingredients*. Aspen Publishers, Gaithersberg. [Accessed online 25-05-01: [www.ucc.ie/fcis/functional\\_foods.htm](http://www.ucc.ie/fcis/functional_foods.htm)]

Stanton R, 1999. 'Who's driving the food supply?' in: *Eating into the Future, the first Australian conference on food, health and the environment*, April 11-13<sup>th</sup>, Adelaide.

Sunley N 1999. Functional foods in an emerging market. *Food Australia* 52(9): 400-2.

Unclesby N 1992. 'Biotechnology and Agricultural Production'. Ch 12, in: *World Food and You*. Food Products Press, NY.

Williams P, 1998. Health Claims and functional foods: time for a regulatory change. *Australian Journal of Nutrition & Dietetics* 55: 2.

### Bibliography

Cho S, 1998. Estimation of Psyllium Fiber of Ready-to-Eat Cereals. *Cereal Foods World* 43(5): 368-9. [Accessed online 25-05-01: [www.scisoc.org/aacc/FuncFood/pdfs/0427-02F.pdf](http://www.scisoc.org/aacc/FuncFood/pdfs/0427-02F.pdf)]

Clydesdale F, 1997. A proposal for the establishment of scientific criteria for health claims for functional foods. *Nutrition Reviews* 55(12): 413-22.

Downer A, 1994. Functional Foods: What's in it for the Australian Food Industry. *Food Australia* 46(9): 414-415.

Functional Foods Incorporated (2001). *Lean on Me & Level Best Product Information*. [Accessed On-line 25-05-01 : [www.functionalfoodsinc.com](http://www.functionalfoodsinc.com)]

Katan M 1999. Functional Foods. *The Lancet* 354: 794.

## Appendix 1: The American Dietitians Association 1999 position statement on functional foods.

Responsibilities for Dietitians/Nutritionists [underlined, my emphasis].

1. Advising consumers on the appropriate intake of functional foods and how to best achieve dietary intake goals, in the context of a healthful diet, to optimise health and potentially decrease the risk of preventable diseases.
2. Participating in research in this evolving field
3. Providing expertise to the food industry related to the development of future functional foods
4. Providing education to health care professionals, the public, the food industry, and policy officials regarding the role of functional foods in health promotion/disease prevention.
5. Working collaboratively with food and nutrition organisations as well as the government to develop and enhance regulatory standards for functional foods that assume such foods are safe and label claims are scientifically sound and not misleading.

6. Being a resource for the media as the research evolves and to specifically provide guidance regarding integration of functional foods into a balanced and varied diet.  
<http://www.eatright.org/adap1099copy.html>

## Appendix 2: Dietary Guidelines for Australians (NHMRC, 1992)

1. Enjoy a wide variety of nutritious foods.
2. Eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruits.
3. Eat a diet low in fat and, in particular, low in saturated fat.
4. Maintain a healthy body weight by balancing physical activity and food intake.
5. If you drink alcohol, limit your intake.
6. Eat only a moderate amount of sugars and foods containing added sugars.
7. Choose low salt foods and use salt sparingly.
8. Encourage and support breastfeeding.

### GUIDELINES ON SPECIFIC NUTRIENTS

1. Eat foods containing calcium. This is particularly important for girls and women.
2. Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes.