# HeinzSight

HEINZ Infant Feeding Advisory Service

THE INFANT NUTRITION NEWSLETTER FOR HEALTH PROFESSIONALS

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## IN THIS ISSUE



## Editorial

In this issue of Heinz Sight, speech pathologist, Pamela Dodrill shares with us the results of a combined study comparing the growth and feeding patterns of preterm and term infants and their future impact on the child. A concerning outcome from the study was that parents of both preterm and term infants felt they were not given enough information about bottle feeding nor about when to commence solid foods. Where to get information on infant feeding and help with feeding problems was also a challenge.

This issue also takes a look at organic foods, one of the fastest growing segments in the supermarket today. Heinz has recently extended its organic range of baby foods to include organic infant cereals.

Please note: Breast feeding is best for babies. Maternal nutrition requirements increase during breastfeeding. Before introducing infant formula, always seek professional advice. Once bottle feeding has been commenced it is difficult to reverse the decision. Partial bottle feeding may adversely affect breast feeding. Always use infant formula as directed because improper use can affect the health of the infant. Always consider the social and financial implications before selecting a method of infant feeding.


**Penelope Stone APD**
**Consultant Dietitian / Nutritionist**
**Heinz Infant Feeding Advisory Service**



*Pamela Dodrill is a Speech Pathologist at the Royal Children's Hospital ( Brisbane), PhD researcher at the Discipline of Paediatrics University of Queensland and Research Scientist at the Children's Research Centre. Her main areas of interest are paediatric feeding development and dysphagia.*

*Others associated with this study include Professor Geoff Cleghorn, Head, Discipline of Paediatrics & Child Health, University of Queensland and Gastroenterologist, Royal Children's Hospital (Brisbane); Associate Professor Peter Davies, Director, Children's Nutrition Research Centre; Tim Donovan Neonatologist, Royal Brisbane & Women's Hospital and Dr Sandra McMahon, Speech Pathologist, SpeechNet Speech Pathology Services.*


## A comparison of the growth and feeding patterns of preterm and term infants

The growth and feeding patterns of preterm infants have recently been studied as part of a combined project between the Discipline of Paediatrics & Child Health, University of Queensland, the Children's Nutrition Research Centre, and the Neonatology Department of the Royal Brisbane & Women's Hospital.

### Why are preterm infants at risk of growth problems?

Three main problems have been identified within the preterm population that have the potential to affect energy balance and hence growth outcomes in this group:

- Increased energy requirements (due to increased incidence of illness and physiological stress)
- Increased energy losses (due to increased incidence of problems such as gastro-oesophageal reflux)
- Reduced energy intake (due to increased incidence of oral feeding problems)

### How many infants were followed up?

A group of 75 preterm infants and 75 full-term infants were followed throughout infancy, and were assessed at term age, as well as at 4, 8, and 12 months corrected age.

### Why do we look at 'corrected age' in preterm infants?

In order to make a valid comparison between the outcomes for an infant born preterm with those of an infant born full-term, the preterm infant's post-natal age needs to be 'corrected' for their degree of prematurity. That is, the preterm infant needs to be classified as the age they would be *had they been born at term* (e.g. an infant born 6 weeks early at 34/40 weeks gestational age, who was now 10 weeks post-delivery, would actually be classified as being 4 weeks corrected age).

# A comparison of the growth and feeding patterns of preterm and term infants CONT.

## How were infants assessed?

A number of investigations were completed with each infant at each time point. These included:

- A growth measurement
- A parent-completed 3 day diet record
- A parent-completed feeding questionnaire
- A clinical assessment of oral feeding skills
- A parent-completed feeding stress questionnaire

## What were the main findings of the studies?

### 1. Growth measurement

- The *length* and *weight* measurements of preterm infants were found to be significantly less than those of full-term infants at term, 4, 8, and 12 months corrected age (Table 1, Figures 1 & 2).
- Within the preterm population, *weight* outcomes were more restricted than length outcomes at each of the ages when measurements were taken (Figure 3). However, these differences were not statistically significant.

This pattern is consistent with growth impairment due to *energy* imbalance.

***Figure 1: Length Standard Deviation Scores (SDS) of Preterm and Full-term Infants: Data at 0, 4, 8, and 12 Months Corrected Age (p<0.001)***

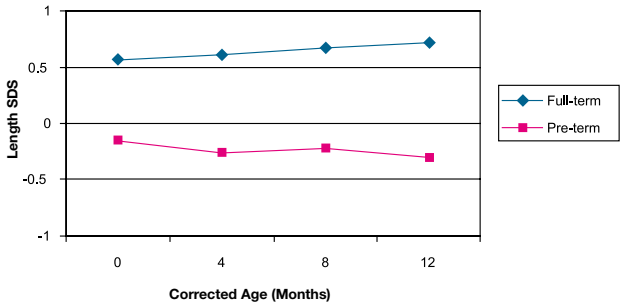



***Figure 2: Weight SDS of Preterm and Full-term Infants: Data at 0, 4, 8, and 12 Months Corrected Age (p<0.001)***

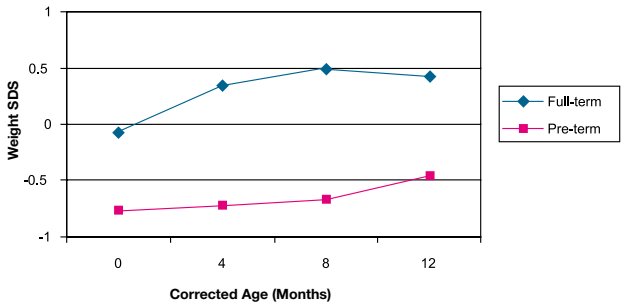
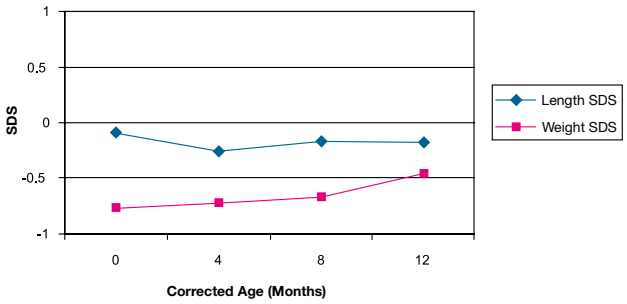



***Figure 3: Length SDS and Weight SDS of Preterm Infants (differences not significant)***




*SDS – standard deviation scores*
*Note: In this graph, the horizontal line in the middle (0 SDS) represents the full-term population mean. The horizontal lines below (-0.5 SDS & -1SDS) represent 0.5 of a standard deviation and 1 standard deviation below the full-term population mean.*

### 2. Three day diet record

- Significantly fewer preterm infants were receiving exclusive breast feeds at 6 weeks corrected age compared with full-term infants.
- Preterm infants took significantly longer *overall* to feed each day than full-term infants (Figure 4).
- Preterm infants required significantly *more feeds* each day than full-term infants (Figure 5).
- Preterm infants took significantly *longer to consume each individual feed* than full-term infants (Figure 6).

***Figure 4: Duration of Feeds (Daily Total) for Preterm and Full-term Infants (p<0.01)***

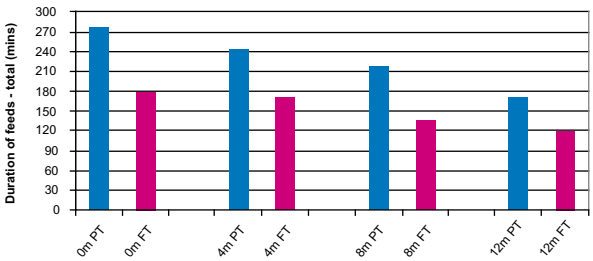



***Figure 5: Number of Feeds (Daily Total) for Preterm and Full-term Infants (p<0.01)***

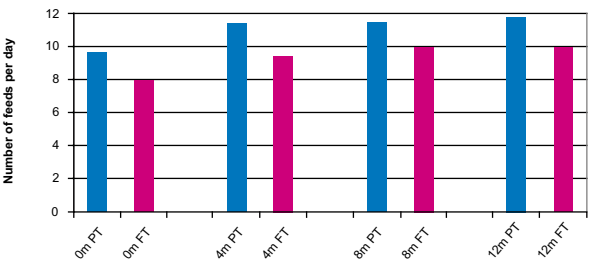


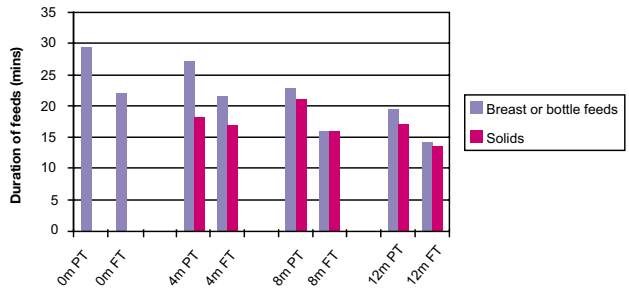

***Table 1: Length and Weight of Preterm and Full-term Infants: Data at 0, 4, 8, and 12 Months Corrected Age (p<0.01)***

| | Group | Term age (0 months) Mean (SD) | 4 months CA Mean (SD) | 8 months CA Mean (SD) | 12 months CA Mean (SD) |
|---|---|---|---|---|---|
| Length (cm) | Full-term | 51.1 (1.53) | 63.8 (2.04) | 71.2 (2.91) | 76.67 (2.01) |
| | Preterm | 49.3 (2.06) | 61.7 (2.54) | 68.7 (2.27) | 73.77 (1.84) |
| Weight (kg) | Full-term | 3.41 (0.26) | 6.69 (0.67) | 8.94 (0.70) | 10.38 (0.79) |
| | Preterm | 3.06 (0.34) | 5.90 (0.69) | 7.86 (0.75) | 9.41 (0.71) |

CA: Corrected Age; SD: Standard Deviation

# A comparison of the growth and feeding patterns of preterm and term infants CONT.

*Figure 6: Duration of Individual Feeds for Preterm and Full-term Infants (p<0.01)*




## 3. Feeding questionnaire

- Compared to the parents of full-term infants, parents of pre-term infants reported having tried significantly more varieties of *formula* and *teats* in an attempt to find one that their infant would tolerate.
- Preterm infants took significantly longer to move to *textured solid food* than full term infants (Figure 7).
- Preterm infants took significantly longer to begin *self feeding* than full-term infants (Figure 8).

*Figure 7: Commencement of Solid Textures for Preterm and Full-term Infants (p>0.05)*

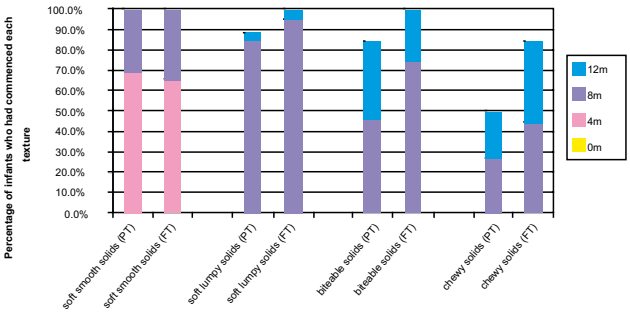
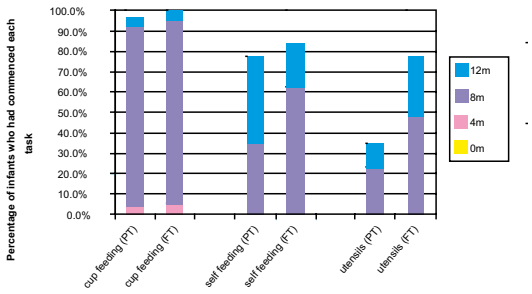



*Figure 8: Commencement of Self-Feeding for Preterm and Full-term Infants (p<0.01)*




## 4. Clinical assessment of oral feeding skills

- Preterm infants displayed significantly more delayed *oral motor skills* for feeding compared to full-term infants.
- Preterm infants displayed significantly more *altered oral sensitivity* compared to full-term infants (likely related to earlier tube feeding / intervention etc.).

Specifically, many preterm infants displayed *oral hypersensitivity* (an increased reaction to normal stimulation within the mouth). This was demonstrated by behaviours such as increased incidence of gagging on food, spitting food out and refusing certain foods.

## 5. Feeding stress questionnaire

- The parents of preterm infants reported significantly more concerns regarding the *volume* that their infant consumed during meals than parents of full-term infants.
- The parents of preterm infants reported significantly more concerns regarding their infant's *behaviour* during meals than parents of full-term infants.
- The parents of preterm infants reported significantly more overall *feeding-related stress* than parents of full-term infants.
- Most parents across both groups reported that they did not feel they were given sufficient *information* about bottle feeding or when to commence solid food.
- Many parents across both groups reported that they did not know where they could access more information regarding infant feeding, or where they could go for assistance if they had concerns regarding their infant's growth or feeding skills/ patterns.

## SUMMARY

The results of these studies demonstrate that, overall, preterm infants displayed *delayed feeding patterns* and *reduced growth* throughout their first year. In addition, parents of preterm infants reported numerous concerns relating to feeding their infant, and reported wanting more *information* and *assistance* relating to infant feeding.

## What impact can poor feeding skills and growth have on a child?

Poor feeding and growth during infancy may have serious long-term implications for children. Feeding problems may:-

- result in airway complications (e.g. aspiration of food / fluid into the lungs), food refusal and poor weight gain.
- contribute to long-term complications such as poor mother-child bonding
- potentially impact on later cognitive development, as well as adult nutritional status.

It is essential that populations at high-risk of early feeding and growth problems are identified and appropriate interventions are offered where necessary.

## Where can parents get assistance?

Most paediatric hospitals in Australia and New Zealand have a multi-disciplinary feeding clinic, where children at risk of oral feeding problems can be assessed by medical staff, as well as a paediatric dietitian and speech pathologist.

# A comparison of the growth and feeding patterns of preterm and term infants CONT.

- ***Paediatric dietitians*** provide advice regarding the volume of feed to meet calorie and nutrient requirements, *(for bottle-fed infants)* the most appropriate formula to suit the infant, and dietary changes necessary in response to food allergies.
- ***Paediatric speech pathologists*** provide advice regarding problems with sucking strength and suck-swallow-breath coordination, *(for bottle-fed infants)* the appropriate teat and bottle to suit the infant, transitional feeding problems (e.g. delayed starting of solids, difficulty managing lumpy foods, food refusal or fussiness), behavioural feeding problems and ways to provide oral stimulation to infants receiving tube feeds to assist later transition onto oral intake.
- ***Paediatric dietitians and speech pathologists*** working in private practice are generally listed in the Yellow Pages, or by contacting the Dietitians Association of Australia or Speech Pathology Australia.

**Note:** The results of these studies are due to be published in relevant medical journals by the end of this year. If you have any queries or would like further information, please contact Pamela Dodrill on **p.dodrill@uq.edu.au**

**ACKNOWLEDGEMENTS** The researchers would like to thank Heinz for their kind contribution of baby food used for the clinical assessment of infants' oral motor and sensory skills for feeding, as part of this project.

# Organic Food

*Holly Vyner is the Marketing Co-ordinator for Biological Farmers of Australia (BFA). She is responsible for BFA's publications including the Australian Organic Journal and coordinates media, marketing and PR activities. Holly is passionate about assisting the sustainable development of the organic industry through education of the public and agricultural sectors.*

Consumer demand for "pure, chemical free" foods is fuelling the growth of the organic food market in Australia which is growing at around 40% annually. Increasing shelf space in supermarkets is now devoted to a large range of fresh as well as packaged, frozen and canned organic foods.

Organic baby foods are an important part of this market. They represent about 10.5% of total baby food sales and have grown by 40% in the past year[1]. This is in spite of their price premium of 25-30% above conventional baby foods! Heinz has an extensive range of organic baby foods which are certified by Australian Certified Organic.

### What are organic foods?

Organic foods are grown and processed without the use of synthetic chemicals, fertilisers, pesticides, herbicides or Genetically Modified (GM) organisms, plants or animals.

Organic farming uses innovative techniques in harmony with the environment to provide nutrient rich, healthy soils to grow healthy produce. Organic is keeping farming sustainable for the future - improving soil, encouraging wildlife and woodlands, keeping pollutants out of our land, air and waterways, preventing disease, and benefiting our health and way of life.

YOUR GUARANTEE OF INTEGRITY
AUSTRALIAN CERTIFIED ORGANIC

### Do organic foods contain any additives?

Organic foods undergo the minimum processing necessary. A minimum number of natural processing aids such as ascorbic acid (vitamin C) and guar gum are approved and must be included on the label when used. These are under constant review and new processing aids can only be added following intense scrutiny.

### Why do they usually cost more?

Organic foods can be more expensive as this represents the true cost of growing nutritious, high quality, "chemical free" produce. Food grown using intensive methods may be cheaper, but may have health, social and environmental costs such as cleaning polluted waterways.

### How do you know if a food is genuinely Organic?

The only way to be sure you are purchasing a genuine organic product is to look for a certification logo. Organic certification is only given when a business complies with the guidelines of organic farming, following an audit by an organic certifying group.

Over 50% of the organically certified operators in Australia are licensed to use the Australian Certified Organic (ACO) logo, which is affectionately referred to as the "Bud". When you see a certification number and logo on the label you can be assured that there is a seamless chain of information about every step in the life of that product - from farm to fork.


**Biological Farmers of Australia (BFA)** is Australia's largest representative organic body. **Australian Certified Organic (ACO)** is a subsidiary of BFA and is Australia's premier certifier of organic produce maintaining conformance with all leading organic standards across the world. Look out for the ACO Bud logo when buying organic products for your guarantee of organic integrity. For more information visit the BFA website: **www.bfa.com.au.**

**References:** [1] *AZTEC MAT 2006*

# Heinz Update

Australian mums are increasingly seeking organic produce for their babies. Heinz has launched a range of organic cereals to complement our organic baby food range in jars. These are now available in Coles and Woolworths nationally. Certification by Biological Farmers of Australia (BFA) is proceeding for cereals and is already confirmed for our baby foods in jars. The "Bud' symbol informs mums of this.

Organic foods provide good nutrition but despite common views to the contrary, there is little nutritional difference between regular and organic produce. Some studies have shown increased phytonutrient levels in organic produce, but this remains an unresolved question. Many will agree that organic simply tastes better!

We know, from asking Mums Australia wide, that they will buy both organic and regular baby foods….the reason being to offer increased variety. Our organic range provides unique recipes and flavour varieties for a delicious alternative to our regular range.

Pesticide residues, preservatives and additives are the potential ingredients in foods that mothers' are most worried about. ALL Heinz baby foods, both regular and organic, are preservative free, with no artificial flavours, no artificial colours and no added salt. The Pure Start® is our commitment to providing baby foods of the highest quality, purity and safety.


Sourcing organic produce in large enough quantities for Heinz is a challenging task. Rice for our organic cereals is grown mostly in New South Wales and is milled at Darling Downs in Queensland. This mill also produces other organic cereals. For this reason, our organic rice cereal label states "contains traces of organic wheat and soy". In fact, the product does not contain these ingredients, but there is a risk that they may be present because they are milled in the same mill. Heinz will always declare the presence of potential allergens.

For more information about our organic range, please see **www.heinzforbaby.com.au** or contact your local HIFAS team member.

**Heather Ferguson APD**
**Dietitian/Nutritionist**
**HJ Heinz Co. Australia Ltd**

# Small Talk

## 1. Nutrient Reference Values (NRVs) For Australia and New Zealand.

The National Health and Medical Research Council (NH&MRC) has released *Nutrient Reference Values (NRVs) for Australia and New Zealand*[1] replacing Recommended Dietary Intakes for use in Australia published in 1991[2]. NRVs give recommended daily intakes of energy, protein, fats, carbohydrate, dietary fibre, vitamins, minerals and other nutrients based on age, sex and life stages. The new NRVs encompass a number of different values for each nutrient (where appropriate) including:-

- ***Estimated Average Requirement ( EAR)*** **–** a daily nutrient level meeting the requirements of half the healthy population for a particular age, life stage and gender.
- ***Recommended Dietary Intake (RDI)*** **–** a level meeting the nutrient requirements for 97-98% of healthy individuals at a particular age, life stage and gender. It can be used to assess the adequacy of an individual's diet.
- ***Adequate Intake (AI)*** **–** is used when no RDI can be established. It is based on observed or experimentally determined estimates of nutrient intakes by a group/s of healthy individuals.
- ***Upper Level of Intake (UL)*** **–** highest average daily nutrient intake that will not cause any adverse health effects.

Over thirty essential nutrients are covered in the NRVs, compared to 19 previously. New additions include dietary fibre, water, linoleic acid, alpha - linolenic acid, long chain omega 3 fats, vitamin D, vitamin K, fluoride, copper and chromium as well as the macronutrients fat and carbohydrate.

For infants, Adequate Intake (AI) is given for each nutrient, with the exception of zinc and iron for infants 7-12 months which have an RDI. Adequate Intakes are derived from the breast milk composition of healthy mothers for infants less than 6 months and on estimates of breast milk intake and complimentary foods for infants 7-12 months. No distinction is made between the requirements of formula fed infants 0-6 months and breast fed infants as done previously.

# Small Talk CONT.

Changes to the recommended intakes of some nutrients for infants (0-12months) and young children (1-3 years) are decreases in zinc, calcium, sodium and increases in folate (Table 1). Adequate intakes for iron have been lowered for infants 0-6 months as iron in breast milk is highly available. Due to iron in infant formula being less available than in breast milk, the iron requirements of formula fed infants are higher. The RDI of iron for infants 7-12 months and children 1-3 years has been increased. Importantly, an AI for Vitamin D has been included and an increase in the AI for iodine. Both vitamin D and iodine are "at risk" nutrients for infants and children.

***Table 1: A Comparison of the Recommended Daily Intakes of Selected Nutrients for Infants and Young Children - 2006 NRVs vs 1991 RDIs.***

| Nutrient | | Infant 0- 6 months AI/RDI | | Infant 7-12 months AI/RDI | | Children 1- 3 years AI/RDI | |
|---|---|---|---|---|---|---|---|
| | | 2006 | 1991 | 2006 | 1991 | 2006 | 1991 |
| **Iron** | **mg** | 0.2 | 0.5 | 11 | 9 | 9 | 6-8 |
| **Vitamin D** | **ug** | 5 | NONE | 5 | NONE | 5 | NONE |
| **Iodine** | **ug** | 90 | 50 | 110 | 60 | 90 | 70 |
| **Calcium** | **mg** | 210 | 300 | 270 | 550 | 500 | 700 |
| **Zinc** | **mg** | 2 | 3 | 3 | 4.5 | 3 | 4.5 |
| **Sodium** | **mg** | 120 | 140-280 | 170 | 320-580 | 200-400 | 320-1150 |
| **Folate** | **ug** | 65 | 50 | 80 | 75 | 150 | 100 |

The NRVs will impact on the core food group tool *The Australian Guide to Healthy Eating*[3], the Australian Dietary Guidelines for children and adolescents[4] and adults[5], as well as food regulations[6] pertaining to food labelling, fortification and health claims. As all are based on previous values, revisions are expected in the future.

NRVs are available from the NHMRC website **http://www.nhmrc.gov.au/publications/index.htm** or by emailing **nhmrc.publications@nhmrc.gov.au** or phone Toll Free 1800 020 103 Ex 9520.

## 2. Body Mass Index (BMI) for assessing overweight and obesity in young children

The Body Mass Index (BMI), a measure of adiposity commonly used for adults, is now recommended for assessing overweight and obesity in young children over 2 years[7]. It is defined as weight in kilograms divided by the height in metres squared.

$$\text{Body Mass Index (BMI)} = \frac{\text{weight in kilograms}}{(\text{height in metres})^2}$$

The Centre for Disease Control and Prevention in the US has produced BMI for age percentile charts suitable for children from age 2 years. BMI for age is plotted on these charts. Overweight is a BMI above the 85th percentile while obesity is above the 95th percentile. Copies of the BMI charts for children are available from **www.cdc.gov/growthcharts**. For children less than 2 years, height and weight age percentile growth charts should be used to assess overweight and obesity.

**Penelope Stone APD**
**Editor**


**References:**

[1] Department of Health and Aging, National Health and Medical Research Council, New Zealand Minsitry of Health. *Nutrient Reference Values for Australia and New Zealand – Executive Summary.* Commonwealth Department of Health 2006

[2] National Health and Medical Research Council. *Recommended Dietary Intakes for use in Australia*. Commonwealth of Australia 1991

[3] *The Australian Guide to Healthy Eating*. Commonwealth Department of Health and Family Services 1998

[4] *Dietary Guidelines for Children and Adolescents*. National Health and Medical Research Council 2003

[5] *Dietary Guidelines for Australian Adults*. National Health and Medical Research Council 2003

[6] *The Food Standards Code*. Food Standards Australia New Zealand

[7] Baur LA, Burrell S *Managing obesity in childhood and adolescence* Medicine Today 2006; 6(7):46-55