



## APPLE NUTRITION

### HEALTHFUL CONTENT

Apples were known in days gone by as “The Body’s Broom”, their pectin, quercetin and phlorodzine content give you a clue as to why.

Pectin Fibre — an important form of soluble (in water) fibre which helps constipation through stool softening, lowers cholesterol by 5%-80% (max. % achieved in a French study using 3 apples a day for 1 month) and is blood sugar balancing for diabetics (see GI below) and others. 15 % of apple pectin is found in the skin of the apple and about 35% in the core. Crab apples have highest pectin content of use in jelly and jam making.

A Low Glycaemic Index Food (GI): apple GI = 54 Apple Juice = 58. Their low GI is largely due to pectin fibre content (see below). GI is a way of measuring how quickly your food is broken down into sugar in your system. Many nutritionists, Aitkins, Barry Sears and Zone Diet advocates advise consumption of foods with a low GI (below 60) as foods with a higher GI have the greatest blood sugar imbalancing effect. This can lead to unpleasant symptoms e.g. dizziness, mood swings as your body attempts to manage this excess sugar by producing excess insulin. Excess blood sugar can be converted to fat and can lead in the long term to increased risk of mature onset diabetes, obesity and cardiovascular disease and compromise your immunity/ability to fight off infections. Recent research has also shown a link between high insulin levels and development of cancer.

### 4 Important Anti-Oxidants

**Quercetin** (a bioflavanoid, also in onions and tea) — Anti-inflammatory and anti-allergy due to inhibiting arachidonic acid cascade e.g. arthritis, asthma, eczema and reducing histamine release respectively. Eye + nerve health e.g. in diabetics it inhibits sorbitol and sugar crystal production involved in retinopathy, neuropathy and cataract formation. Anti-viral-herpes and flu virus. Toxic metal removal and at high doses anti-cancer action (anti proliferative, encourages cell re-differentiation, competes for oestrogen receptors, anti-metastatic-strengthening cellular exoskeleton of collagen ). Works synergistically with Vit C. Cardiovascular protection — anti-oxidant actions against cholesterol peroxidation and damage and reduces platelet aggregation and blood stickiness. Highest in coloured skin of apple in sun or top of the tree and varietally in Elstar over Jonagold although both have reasonable quercetin content.

**Phloridzin** — a liver detoxification support polyphenol, more powerful than milk thistle (silymarin). Individual apple content not affected by position on tree.



**Catechins** (e.g. C, GC, EC types) — another type of flavanol anti-oxidant present in apples (and also in tea and chocolate).

**Vitamin C** — usually 10mg/100 grams. As a general rule the sharper and greener the apple the higher the Vit C content. 50% of Vit C content is in the core and the peel. The Royal navy issued cider for 200 years to prevent scurvy.

## PIGMENTS

The colour of the apple is a result of chlorophyll (also a source of magnesium), anthocyanins (gives blush to the skin + related to light exposure) and carotenoids (orange blush). Last 2 are also anti-oxidants.

**Tannins** — tannin pigment rich apple varieties are the crab apple and those closely related to it. The archaeological record of GB suggests the former were halved and dried for winter use. The latter are known as “apple sharps” by pomologists and used in traditional cider making in the West and South West of England (e.g. Foxwhelp, Dymock Red, Cowarne Red, Joely Crab, Kingston Black, Skyries Kernal etc.). A wide range of traditional ciders are available from some supermarkets and York Beer and Cheese Shop 28 Sandringham Street near Fishergate. In a study with IFR (Institute of Food Research, Norwich ) Dr Caroline Walker (at Brewing Research International, Surrey) discovered after analysing 18 UK ciders that “*cider has the same levels of antioxidant polyphenols and tannins as red wine*” and that cider antioxidants were absorbed very quickly, increasing their effect. Tannins have widely reported research backing their anti-cancer and cardioprotective effect.

## ACIDS

**Chlorogenic Acid** — a hydroxycinnamic acid anti-oxidant also present in russett potatoes (chip potatoes) and also found in high concentrations in sunflower seeds, blueberry, coriander leaves. Highest in Elstar varieties over Jonagolds. Individual apple content not effected by position on tree.

**Ellagic Acid** — an important anti-oxidant found in raspberries, walnuts etc. and wood matured drinks (from whence it leaches) like traditional cider, whisky from oak caskets (en barrique). Used in one research trial effectively against cervical cancer.

**Malic Acid** — The tarter the apple the less the sugar and greater malic acid content, enabling flavour retention with cooking (e.g. Bramley’s). Malic acid is used therapeutically for Fibromyalgia (see supplements) and a variety of neuromuscular complaints especially ME related or in those with high levels of aluminium in their body.



## HARMFUL CONTENT

Unfortunately the annual WHICH pesticide report, based on MAFF research of shelf Fruit and Vegetables, still reports apples as a consistently high risk contaminant food with 30-40% shelf apples having chemical residues and many having multiple residues present. This is not surprising as after wheat, apple is the most chemically intensively cultivated crop with on average 17 spray applications being used per growing season. In the wetter Northern Europe (e.g. Netherlands and GB these are predominantly herb- and fungicides against scab and mildew, whereas amongst drier Mediterranean fruit growers there is higher insecticide use). This leaves the punter with 3 choices: grow your own, buy organic or wash/peel your apples. Peeling removes 90 % of pesticides but also a great deal of the nutritional benefit! Cooking too is reported to break down some pesticides.

**Some Residues:** Chlorpyrifos-neurotoxic OP insecticide, Bifenthrin-pyrethroid insecticide for aphids (neurotoxic, possibly carcinogen), Carbendazim-fungicidal hormone disrupter.

## FRESH and LOCAL as well as ORGANIC

The tip here is smell before you buy. The IFR (Norwich) have discovered that the smell of an apple results from an interaction of 250 volatile esters, alcohols, aldehydes and essential oils present. These volatile chemicals evaporate with time i.e. with loss of freshness!

## Apple Based Supplements

**Biocare Hepaguarde and Hepaguarde Forte:** both liver detoxification support supplement with phloridzine, the latter is used especially in female hormone imbalance conditions e.g. fibroids, PMS etc. (Birmingham Co.).

**Solgar Apple Pectin**, with pectin fibre only and Multi Fibre caps, contains soluble fibre from apple and grapefruit as pectin, from oat bran and from psyllium plus insoluble (in water) fibre as flax. (US Co.). Insoluble fibre is used to reduce risk colorectal cancer, haememarroids by aiding waste and parasite elimination through bulking out stool reducing constipation.

**Bional Appleslim** — Contains 500mg cider vinegar in each cap aimed at correcting acid/alkaline balance of the body, aiding digestion, reducing cholesterol and weight loss, along with B Vits to support energy levels/metabolism and nervous system (Dutch Co.).

**Metagenics Fibroplex** — Malic Acid. (US Co.) and Biocare Magnesium Malate



## Quercetin Apple Content<sup>1</sup> (in decreasing order)

- **Jonagold** (a hybrid of Jonathon and Golden Delicious, New York).
- **Cox's Orange Pippin.**
- **Elstar** (a hybrid of Ingrid Marie and Golden Delicious, Netherlands).
- **Golden Delicious.**
- **Granny Smith.**
- **James Grieve.**

## Useful Accompaniments

Baked and Stewed Apple with Cinnamon (a good end to a meal) — as cinnamon helps blood sugar balance. As a warming digestive tonic, acts as anti-spasmodic and in wind releasing, anti-ulcerative, useful in those with debilitation and fatigue and as acts as sedative.

There is a Gaelic saying "*an ubhal (apple) as airde*" which means self-betterment is like reaching for the highest apple. As all the flavanoid content and quercetin has recently been found to be highest in apples at the top of the tree (lowest on inner tree fruit), the old saying once again may prove to be not so far off the mark, if you are seeking self-betterment through health!

## References:

Avoiding Pesticide Residues WHICH September 2003.

Brown, Judith E (1999) Nutrition Now, London : Wadsworth Publishing Co. (Thomson), ISBN 0 594 56439 9.

FOE (Friends of the Earth) — [www.foe.co.uk](http://www.foe.co.uk).

Healey, Joy Tannins (2001) Time for a reprieve, *Nutrition Practitioner* Vol. 3 Issue 2 (July 2001) pp 22-29, ISSN 1472 0094

Hertog, Michael G.L. *et al* (1992) Content of Potentially Anti-carcinogenic Flavonoids of 28 Vegetables and 9 Fruits Commonly Consumed in the Netherlands. *J. Ag. Food Chemistry* Vol. 40 pp 2379-2383.

Laing, Tim and Clutterbuck (1991) "*P is for Pesticides*", London : Ebury Press, 1991, ISBN 0-85-2223-9688.

Moffat, Alistair (2001) "*The Sea Kingdoms: A History of Celtic Britain and Ireland*", London : Harper Collins, ISBN 00-65324-3-8

Mohamed Abdel-Gahni Awad (2001) The Apple Skin, Colourful Healthiness — Developmental and Environmental Regulation of Flavonoids and Chlorogenic Acid in Apples, 26 June, 2001 (Dissertation, Wageningen University)

---

1.) Most of flavonoid nutritional content research carried out at Wageningen Agricultural University, Netherlands.

## FACTSHEET NCF0101

Last printed: 2005-02-04 (18:55:00)

Ursula Fearn - Page 5 of 5



PAN (Pesticides Action Network) UK — [www.pan-uk.org](http://www.pan-uk.org)

Polunin, Miriam (1997) *Healing Foods*, London, Doring Kindersley, ISBN 0-7513-0412-3

Renfrew, Jane (1985) *Food and Cooking in Prehistoric Britain*, English Heritage, ISBN 1830-74-5331

Quinion, Micheal B. (1997) *Cidermaking*, Risborough Shire Publications, ISBN 0-85263-614-8