APPLEPHENON® POLYPHENOL S
**APPLEPHENON® POLYPHENOLS**

**FROM THE LAND OF THE ORIGINAL APPLE**

ApplePhenon® is carefully extracted from specially selected wildcrafted immature green apples from Central Asia, the "Land of the Original Apple." Using a proprietary gentle extraction process, ApplePhenon® from BGG preserves the highest concentration of apple polyphenols, strong antioxidant activity and an optimized profile of proanthocyanidins. Clinical studies have shown that ApplePhenon® plays an effective role in antioxidant, weight, glucose management, dental care, cardiovascular protection, athletic enhancement and allergy support. ApplePhenon® has been GRAS self-affirmed in USA and can be used in all food, beverage and dietary supplement applications.

- **Patented:** Protected by 5 international product, process and use patents
- **Trademarked:** Worldwide trademark registration
- **Researched:** Supported by more than 50 publications
- **Tested:** Clinically validated for 7 different health benefits
- **Safe:** Self-affirmed GRAS in USA
- **Wildcrafted:** Extracted from hand-picked apples from the "Land of the Original Apple"
- **Water Soluble:** Suitable for beverages, cosmetics and dental products
- **Exclusive:** BGG is the worldwide exclusive supplier Ex-Japan
- **Highly Stable:** 36 month shelf life

**ADVANCED PROPRIETARY PROCESS**

ApplePhenon® by BGG is a patented, proprietary polyphenol extract produced from wild, unripe apples from the Central Asia region where the species originated. Using a proprietary mild extraction process and advanced purification technology, ApplePhenon® is produced to preserve high concentrations of apple polyphenols, strong antioxidant properties and optimized profile of proanthocyanidins. The starting raw material for producing ApplePhenon® are unripe apples containing at least ten times the level of polyphenols found in ripe apples.

**WHAT IS APPLEPHENON® POLYPHENOLS EXTRACTED FROM WILD UNRIPE APPLES**

- **CATECHINS** (Monomer)
- **OLIGOMERIC PROCYANIDINS** (Catechins Polymers)
- **FLAVONOIDS** (Chalcones, etc.)
- **PHENOCARBOXYLIC ACIDS**

NATURAL ANTIOXIDANT

Fig 1. Major flavonoids in ApplePhenon®

<table>
<thead>
<tr>
<th>Mer</th>
<th>Description</th>
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<tbody>
<tr>
<td>2</td>
<td>Catechins (Monomer)</td>
</tr>
<tr>
<td>3</td>
<td>Oligomeric Proanthocyanidins (Catechins Polymers)</td>
</tr>
<tr>
<td>4</td>
<td>Phenocarboxylic Acids</td>
</tr>
<tr>
<td>5</td>
<td>Flavonoids (Chalcones, etc.)</td>
</tr>
<tr>
<td>6</td>
<td>Phenosin Polymers</td>
</tr>
<tr>
<td>7</td>
<td>&gt; 7 mer</td>
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**Fig 1 Major flavonoids in ApplePhenon®**
ApplePhenon’s active constituents are listed in the table below. ApplePhenon® possesses a unique phytochemical profile, with about 12% of flavanol monomers (catechin and epicatechin) and a high content of oligomeric procyanidins.

Table 1. Composition of Polyphenols in ApplePhenon®.

ApplePhenon® has a much higher content of oligomeric procyanidins compared to grape seed extracts. Green tea extracts contain monomer and dimers almost exclusively while grape seed extracts are rich in polymeric procyanidins. This is of paramount importance in a pre-clinical trial, the polymeric procyanidins in ApplePhenon® positively and synergistically promoted the absorption of procyanidin oligomers (which are the only procyanidins that are absorbed by the human body).

**Fig 2. Size-exclusion chromatography of ApplePhenon® and other polyphenol products.**

**Fig 3. Free non-conjugated procyanidins in rat plasma 2 hours after administration.**

**Fig 4. ORAC values of polyphenols (μmolTE/g)**
WEIGHT MANAGEMENT

Pre-clinical studies demonstrated that ApplePhenon® decreases the transcription of genes involved in fatty acid synthesis, similarly to a restricted food diet. It may also contribute to suppression of visceral adipose tissue accumulation. Furthermore, it has been shown that administering apple polyphenols markedly decreases the Firmicutes/Bacteroidetes ratio and increases the proportion of Akkermansia by a factor of eight, influencing the gut microbiota and the intestinal metabolism which (has beneficial effects on metabolic homeostasis).

Clinically, ApplePhenon® at 600 mg per day has proven effective in decreasing visceral fat within an 8 to 12 week timeframe in a randomized, double-blind and placebo controlled study in 94 subjects with BMI 25-30. In addition, a smaller group of 30 subjects (BMI 18-30) an excessive dose of ApplePhenon® for 4 weeks has been shown to have no deleterious effects. Similarly, the visceral fat area and the level of adiponectin in the ApplePhenon® group improved as fatty acid synthesis similarly to a restricted food diet. It may also contribute to suppression of visceral adiposity.

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GLUCOSE MANAGEMENT

Recent preclinical studies suggest that chronic administration of ApplePhenon® helps maintaining healthy blood sugar metabolism in obese diabetic db/db mice. Furthermore, cohort studies associate fruit consumption with a lower risk of type 2 diabetes mellitus. A double-blind study was done recently on 65 subjects with fasting plasma glucose levels of 100-125 mg/dL over 12 weeks. The subjects randomly received 600 mg per day of ApplePhenon® tablets or placebo. The treatment group receiving ApplePhenon® experienced a significant reduction in glucose increases at 30-min post 75 mg oral glucose tolerance test compared to placebo, suggesting that ApplePhenon® may help maintain normal range healthy blood sugar levels.

DENTAL CARE

ApplePhenon® can inhibit glycoyltransferase (GTE) of dental bacteria Streptococcus mutans and Porphyromonas gingivalis, therefore preventing dental plaque formation. A clinical study on twenty 18-20 year old women who rinsed their mouths with 50% of ApplePhenon® solution (6.5 mg/mL) three to five times a day for three days showed a significant decrease of dental plaque formation. Chewing gum with a low dose of 0.024%, ApplePhenon® for five minutes can inhibit the production of methanol (MeSH), the main cause of bad breath.

SKIN CARE

ApplePhenon® has been evaluated in two clinical studies targeting the skin. In a first pilot study on 24 subjects it has been shown that oral administration of ApplePhenon® at 10 mg/kg may be effective as a complimentary support for skin disorders. A second 3-armed study on 65 female subjects at dosages of 300 mg and 600 mg per day over 10 weeks showed an obvious skin-whitening effect versus placebo. ApplePhenon® group experienced a significant improvement in performance levels.
## Recommended Dosage by Application

<table>
<thead>
<tr>
<th>USE</th>
<th>DOSAGE (ADULTS)</th>
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<tbody>
<tr>
<td>LDL Cholesterol Decreasing</td>
<td>600 mg/day</td>
</tr>
<tr>
<td>Lipid Metabolism Improvement</td>
<td>600 mg/day</td>
</tr>
<tr>
<td>Weight Control</td>
<td>600 mg/day</td>
</tr>
<tr>
<td>Respiratory support</td>
<td>50 – 200 mg/day</td>
</tr>
<tr>
<td>Dental Care</td>
<td>5 mg/3-5 times/day</td>
</tr>
<tr>
<td>Skin Care</td>
<td>300 – 600 mg/day</td>
</tr>
<tr>
<td>Athletic Performance Improvement</td>
<td>1200 mg/day</td>
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