

## ILHWA - ENZYME FERMENTED GINSENG White Paper

*Panax ginseng* is considered to be one of the fundamental tonics in traditional Chinese medicine. In fact, it may be the world's best known herb. *Panax ginseng* has been used medicinally in Asia for more than 5,000 years and has been known in Chinese ethnopharmacology for more than 3,000 years. Pharmacologically speaking, ginseng is classified as an adaptogen. Ginseng is the world's most powerful adaptogenic herb which assists the body to manage stress and achieve homeostatic balance, optimizing the body's ability to resist fatigue, stress, trauma, and support healthy aging and overall wellness. Ginseng has a remarkable capacity to restore the body's natural balance.

As an adaptogen, ginseng supports nonspecific resistance to biochemical and physical stressors, thereby improving vitality and well-being. Reviews suggest *Panax ginseng* has immunomodulating activity by affecting the hypothalamic-pituitary-adrenal (HPA) axis. Clinical studies have shown that ginseng extract stimulates the immune system, improves mental and physical performance, reduces fatigue, supports healthy glucose regulation, and improves overall quality of life.<sup>i,ii,iii,iv</sup>

The unique active compounds found only in *Panax ginseng* are plant saponins called ginsenosides. Other plants that have the common term "ginseng" in their names are not true ginseng since they are from a different genus or family and do not contain these unique compounds. These include Siberian ginseng (*Eleutherococcus senticosus*), Prince ginseng (*Pseudostellaria paniculate*), Indian ginseng/Ashwagandha (*Withania somnifera*), and Brazilian ginseng/Suma (*Pfaffia paniculata*).

The quality and efficacy of *Panax ginseng* extracts may also be influenced by harvest time and processing methods. Red ginseng is ginseng root that has been peeled, heated (usually through steaming at standard boiling temperatures of 100 °C) and then dried or sun-dried. White ginseng has been processed without heat and air dried. A study comparing the ginsenoside content of the most common red ginseng extract versus a uniquely processed white ginseng extract showed that this white ginseng extract has higher level of ginsenosides. (Note: this is not common with most white ginseng extract) In fact, the level of ginsenoside Rg1, the indicator of anti-fatigue activity was found to be three or four times higher in this white ginseng than that of red ginseng.<sup>v</sup> Growing time also impacts ginsenoside content, with roots from plants older than five years being more potent than roots from one- to two-year-old plants. In fact, a study measuring ginsenoside content of ginseng roots every year up for up to 6 years reported that the maximum accumulation of ginsenosides was recorded in the roots at the 5<sup>th</sup> year.<sup>vi</sup> The common practice of harvesting 6 year-old roots may have other limitations as well, compared to 5 year root processing.

While all this science instructing manufacturers on the best way to process and harvest ginseng is important, another factor is fundamental to making an efficacious ginseng extract. It turns out the availability of intact ginsenosides is extremely low. Orally administered ginsenosides are very hard to breakdown by gastric juices or liver enzymes. They can, however, be metabolized by intestinal bacteria and then these metabolites are absorbed from intestines. Recent studies demonstrated that ginsenoside metabolites had greater biological effects than ginsenosides.<sup>vii</sup>

### **GS15-4® (active ingredient in ILHWA FERMENTED GINSENG Products)**

#### **Fermented *Panax Ginseng* Extract – Adaptogenic Energy**

#### **ILHWA The 21<sup>st</sup> Century Ginseng**

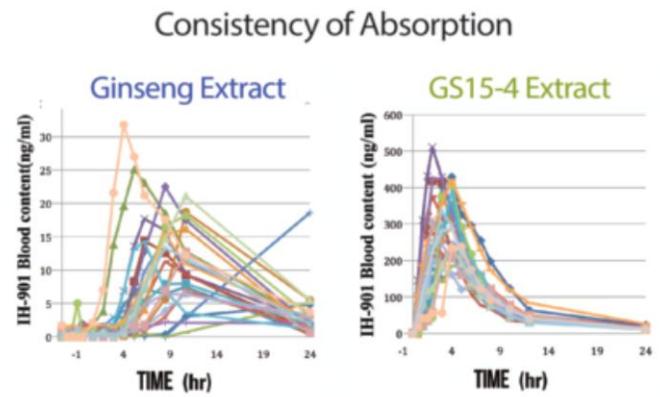
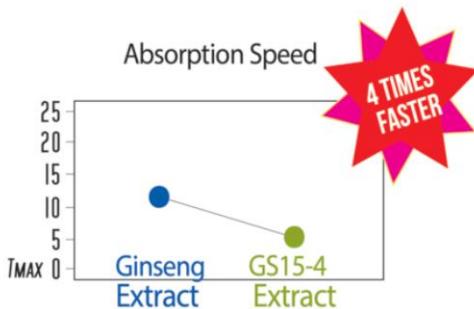
Through decades of consistent scientific leadership, the Korean ginseng manufacturer ILHWA Co. Ltd., has developed the world's most efficacious and balancing ginseng extract, GS15-4®. ILHWA uses a proprietary process that incorporates all the best current science to produce a "21st Century Ginseng Extract". First, ILHWA uses white ginseng root that has not been peeled, as peeling removes the minor rootlets and hair rootlets that carry key bioactive compounds. Second, they use a proprietary low heat vacuum extraction of the whole unpeeled root, which maintains the vitamins, amino acid profile and organic germanium lost in the high heat steaming process used in traditional processing. Third, ILHWA harvests the roots at the optimum time between the 4<sup>th</sup> and 5<sup>th</sup> year. In comparison, red ginseng extract available from most companies use the traditional 6 year harvested root. Finally and most importantly, ILHWA uses a proprietary enzyme fermentation process to improve absorption. High-yield enzyme fermentation mimics the fermentation that occurs in the intestine to transform ginsenosides to an end-stage metabolite called compound K or IH-901. Compound K has been proposed to be the most bioavailable metabolite from colonic fermentation.<sup>viii</sup> Fermented ginseng extract containing this metabolite have been shown to have many adaptogenic qualities such as strong antioxidant,<sup>ix</sup> anti-stress,<sup>x</sup> hepatoprotective,<sup>xi</sup> anti-allergy and anti-inflammatory<sup>xii</sup> activities as well as support healthy glucose and lipid regulation.<sup>xiii</sup> In addition, GS15-4® has been clinically proven to provide 15 times increased absorption, 4 times faster absorption and 4 times more consistent absorption (Figures 2-4). In addition, the fermentation process also provides an improved taste profile compared to conventional ginseng extracts. Improved bioavailability means improved adaptogenic support for fatigue and stress.

### **Conclusion**

For a number of reasons, more consumers are seeking caffeine-free energy from supplements and beverages. Whether consumers have a fear-based response to the media reports on highly-caffeinated energy drinks, or are simply looking for a different type of energy than the jittery, addictive energy from caffeine, product developers are more likely to find a receptive audience for caffeine-free energy than ever before. In addition, the energy category is evolving beyond

simple “stimulant” energy we get from caffeine and beginning to recognize that “energy” has many profiles that can be offered to fit consumers’ lifestyles and interests.

Ginseng extract also has thousands of years of traditional use for energy and vitality. It also has a different energy profile which could be called “adaptogenic” energy. GS15-4®’s proprietary processing leads to better absorption of the active components of ginseng, providing higher accessibility for this adaptogenic energy profile.



<sup>i</sup> Lakshmi T, et al. Panax Ginseng: A universal panacea in the herbal medicine pharmacological spectrum – A review. *Asian Journal of Pharmaceutical and Clinical Research*. 2011;4(S1):14-18.

<sup>ii</sup> Thorne Research. Panax Ginseng Monograph. *Alternative Medicine Review*. 2009;14(2):172-176.

<sup>iii</sup> Reay JL, et al. Panax ginseng improves aspects of working memory performance and subjective ratings of calmness in healthy young adults. *Hum Psychopharmacol*. 2010;25(6):462-71.

<sup>iv</sup> Choi KT. Botanical characteristics, pharmacological effects and medicinal components of Korean Panax ginseng C A Meyer. *Acta Pharmacol Sin*. 2008; 29 (9): 1109–1118.

<sup>v</sup> Ko SK, et al. Analysis of Ginsenosides of White and Red Ginseng Concentrates. *Korean Food Science and Technology*. 2003;35:536-539.

<sup>vi</sup> Xiang-guo L, et al. Ginsenoside Content in The Leaves and Roots of Panax ginseng at Different Ages. *Life Science Journal*. 2012;9(4):679-683.

<sup>vii</sup> Leung KW and Wong AST. Pharmacology of ginsenosides: a literature review. *Chinese Medicine*. 2010; 5(20):1-7.

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- <sup>viii</sup> Hasagawa H. Proof of mysterious efficacy of ginseng: basic and clinical trials: Metabolic activation of ginsenoside: Deglycosylation by intestinal bacteria and esterification with fatty acid. *Journal of Pharmacological Sciences*. 2004;95:153-157.
- <sup>ix</sup> Ramesh T, et al. Effect of fermented Panax ginseng extract (GINST) on oxidative stress and antioxidant activities in major organs of aged rats. *Exp Gerontol*. 2012 . 47(1):77-84.
- <sup>x</sup> Kitaoka K et al. Fermented Ginseng Improves the First-Night Effect in Humans. *Sleep*. 2009;32(3):413-421.
- <sup>xi</sup> Lee HU, et al. Hepatoprotective effect of ginsenoside Rb1 and compound K on tert-butyl hydroperoxide-induced liver injury. *Liver International*. 2005;25: 1069–1073.
- <sup>xii</sup> Yang CS, et al. Compound K (CK) Rich Fractions from Korean Red Ginseng Inhibit Toll-like Receptor (TLR) 4- or TLR9-mediated Mitogen-activated Protein Kinases Activation and Pro-inflammatory Responses in Murine Macrophages. *Journal of Ginseng Research*. 2007; 31( 4): 181-190.
- <sup>xiii</sup> Yuan HD, et al. Beneficial effects of IH-901 on glucose and lipid metabolisms via activating adenosine monophosphate-activated protein kinase and phosphatidylinositol-3 kinase pathways. *Metabolism Clinical and Experimental*. 2011;60: 43–51.