



# Wellmune WGP<sup>®</sup> Research Summary

*Wellmune WGP is a Product of Biothera,  
the Immune Health Company*

## **Sales Contacts:**

Steve Meredith  
Vice President, Sales  
U.S. and Canada  
801.944.8868  
smeredith@biothera.com

Darryl Mircheff  
Vice President, Sales  
Pacific Rim  
949.370.9044  
dmircheff@biothera.com

Allen Porter  
Vice President, Sales  
International  
651.256.4622  
aporter@biothera.com

Dario Herrera  
Director, Sales  
Latin America  
651.256.4601  
dherrera@biothera.com

Biothera  
3388 Mike Collins Drive  
Eagan, MN 55121  
USA

[www.wellmune.com](http://www.wellmune.com)

# Wellmune WGP®: Nature's Immune Enhancer

*An Innovative Functional Food and Beverage Ingredient  
That is Clinically Proven to Enhance Immune Function*

*A Product of Biothera, the Immune Health Company*

## **Introduction.**

Wellmune WGP® is a natural food, beverage and supplement ingredient that is clinically proven to safely prime the immune system to help keep the body healthy. Researchers have demonstrated that Wellmune WGP helps mobilize billions of innate immune cells that are part of the body's natural defenses. It helps these cells to do their jobs effectively without stimulating the immune system, which can be harmful to long-term health. This unique ingredient's patented, year-round protection is the culmination of more than \$300 million in research with leading university and government institutions.

The potential for immune-supporting products spans virtually all food and beverage categories now that the importance of immune health has reached critical mass among consumers. According to a 2012 study published in the *Journal of the American Medical Association*, immune health was one of the top three reasons consumers took supplements in the past two years. "Immune health" was cited more often than "pain relief," "weight control" or "reducing heart attacks." The compelling safety and efficacy research supporting Wellmune WGP make it an ideal ingredient for delivering real health benefits to consumers.



**Wellmune WGP® is a unique beta 1,3/1,6 glucan, a natural carbohydrate derived from a proprietary strain of baker's yeast.**

- A natural functional ingredient designed for foods, beverages and supplements
- Clinically proven to prime the immune system
- GRAS-approved under U.S. FDA regulations; regulatory approval in Europe, China, Australia and other countries around the world
- Kosher, Halal, non-allergenic and GMO-free



## Wellmune wGP Mechanism of Action

Wellmune wGP is a natural yeast beta glucan derived from the cell walls of a highly purified, proprietary baker's yeast (*Saccharomyces cerevisiae*). This unique ingredient triggers human immune defenses that have evolved over thousands of years to protect the body.

The scientific understanding of Wellmune wGP's mechanism of action in the body is well documented in published, peer-reviewed research. Mechanism of action studies as well as measurement of significant changes in immune responses are changing the way researchers and physicians think about innate immune function.

Once swallowed, immune cells in the gastrointestinal tract take up Wellmune wGP and transport it to immune organs throughout the body. While in the immune organs, immune cells called macrophages digest Wellmune wGP into smaller fragments and slowly release them over a number of days. The fragments bind to neutrophils, via complement receptor 3 (CR3), which are the most abundant immune cells in the body. In fact, neutrophils account for 40-70% of all immune cells.

Activated by Wellmune wGP, the neutrophils are now primed for activity. Unlike other immune health ingredients, Wellmune wGP supports immune function without stimulating the immune system, which may be harmful.

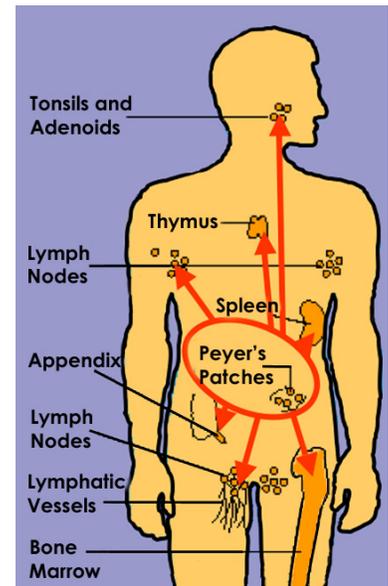
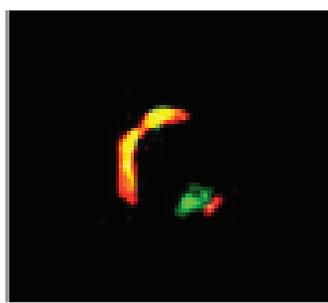


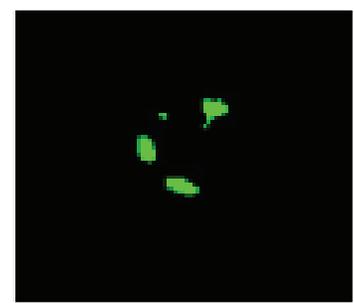
Figure 1



Day 1: Wellmune wGP ingested by macrophages.



Day 2: Macrophages degrade Wellmune wGP and release tiny fragments.



Day 3: Wellmune wGP fragments bind to neutrophils, priming them for activity.



Researchers discovered the mechanism of action through a series of experiments, including those with CR3-deficient mice that confirmed the critical role this receptor plays in triggering an immune response. Other studies tracked fluorescently dyed Wellmune WGP as immune cells transported it throughout the body (figure 1). Within days Wellmune WGP is carried to the spleen, bone marrow and other immune organs.



In a separate study, significant improvement was observed in the killing activity of immune cells. Phagocytic cells, which literally engulf and destroy foreign challengers, showed greater microbial killing in subjects who had taken Wellmune WGP.

Most recently, researchers have focused on specific immune biomarkers that may link health benefits to changes in immune function. While more research is needed, the studies confirm immunological activity consistent with the presence of Wellmune WGP.

## **Applications and Marketing Claims**

Wellmune WGP is designed for the majority of food, beverage and supplement applications. Based on our clinical research, we believe that Wellmune can support compelling and regulatory-compliant marketing claims focusing on the reduction of immune suppression associated with physical and lifestyle stress. In particular, the data supports numerous marketing positions, including sports nutrition, healthy aging, stress management and general health and wellness.

Wellmune WGP is available in two powder forms — dispersible for food and select beverage applications and water soluble for certain beverage applications with clarity or other manufacturing requirements. In water at 1 mg per milliliter, soluble Wellmune WGP is odorless, clear and with mild to no taste.

# Research - Proof of Efficacy

Biothera is committed to a robust research and development program to evaluate the efficacy of Wellmune WGP in humans under various physical and psychological stress situations. Years of research has resulted in a product with a well-defined mechanism of action, a compelling body of credible, peer-reviewed science and increasing clinical support of its efficacy.

Nine clinical studies consistently demonstrate the positive health benefits of Wellmune WGP on the physical and psychological health of individuals experiencing lifestyle and physical stress that often directly lead to illness. The studies featured several different populations, including firefighters, marathoners, medical students and individuals with high lifestyle stress. Each of the following pages highlights select results from these studies. Beginning on page 15 is a bibliography of Biothera's clinical and preclinical research.

The complete body of research supporting Wellmune WGP includes additional clinical research, numerous preclinical studies and human biomarker research. Biothera remains committed to ongoing research that advances the science of its ingredients and understanding of immune health.

For additional information, please visit [www.wellmune.com](http://www.wellmune.com).



Study Name	Study Type	Published
1. Texas Marathon	Physical Stress Health Effects	<i>Journal of Dietary Supplements</i> , 2013
2. Exercise Stress	Biomarkers	<i>British Journal of Nutrition</i> , 2012
3. Medical Students	Physical / Lifestyle Stress	<i>Nutrition</i> , 2012
4. Lifestyle Stress 90-day	Lifestyle Stress Health Effects	<i>Journal of American College of Nutrition</i> , 2013
5. Lifestyle Stress 28-day	Lifestyle Stress Health Effects	<i>Agro Foods Industry Hi Tech</i> , 2010
6. Allergy	Allergic Rhinitis Health Effects	<i>Food Science &amp; Nutrition</i> , 2012
7. California Marathon	Physical Stress Health Effects	<i>Journal of Sports Science &amp; Medicine</i> , 2009
8. Cold/Flu	Cold/Flu	<i>Journal of Applied Research</i> , 2009
9. Firefighters§	Physical Stress Health Effects	Presented at Am. Soc. of Sports Medicine, 2008
§Manuscript in preparation		

Study #1:  
Texas Marathon



Marathoners taking Wellmune for four weeks experienced a 40% reduction in upper respiratory tract infection symptoms in comparison to the control group.

# Wellmune WGP Reduced by 40% Upper Respiratory Tract Infection Symptoms among Marathoners

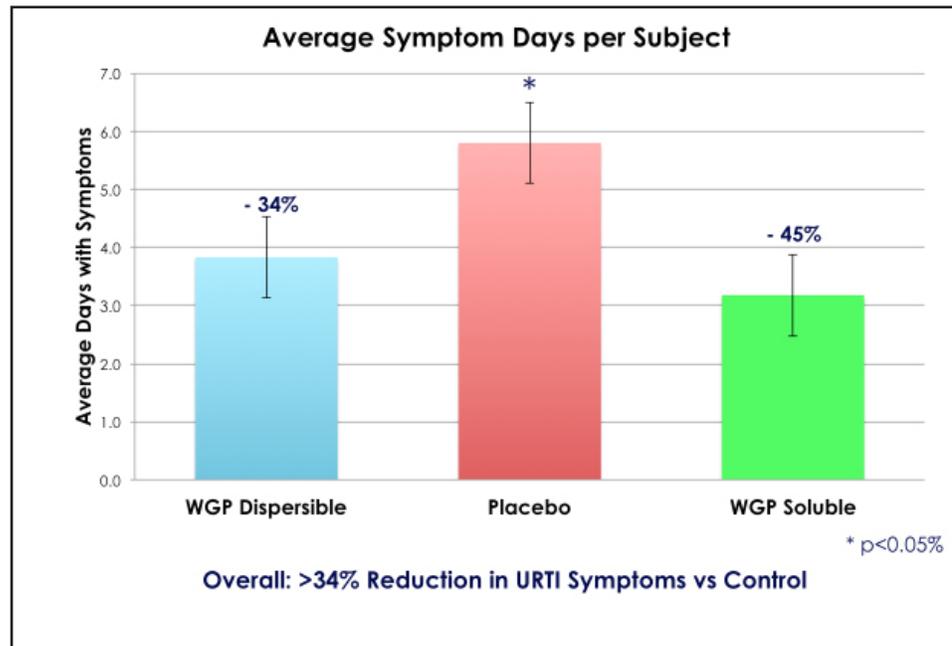
A study of 182 runners who completed the 2011 LiveStrong Marathon in Austin, Texas, confirmed previous clinical research showing that Wellmune WGP®'s support of the immune system has real benefits for individuals under physical stress. The study was conducted by the Health and Human Performance Lab at the University of Houston.

## Study Protocol

It is common for runners to develop upper respiratory tract infections (URTI) in the days and weeks following completion of a marathon. The double-blinded study included 96 men and 86 women with an average age of 34 and an average finish time of 4:00 hours. These participants were given either 250 mg of Wellmune soluble or Wellmune dispersible daily or a placebo of rice flour to take for four weeks following the LiveStrong marathon.

## Results

Wellmune WGP supplementation significantly reduced the number of days that subjects reported both general health problems as well as cold/flu symptoms. Based on previous studies conducted by the University of Houston, it is reasonable to speculate that the improvements associated with Wellmune were likely due to alterations in monocytes, plasma cytokines, and improved mucosal immunity.



"Baker's Yeast Beta Glucan Supplementation Increases Salivary IgA and Decreases Cold/Flu Symptomatic Days After Intense Exercise." *Journal of Dietary Supplements*, Early Online:1-13, 2013. Available online at [www.informahealthcare.com/jds](http://www.informahealthcare.com/jds)  
DOI: 10.3109/19390211.2013.820248.

## Study #2: Exercise Stress



**Study Protocol:**  
The randomized, double-blinded, placebo-controlled study involved 60 recreational athletes taking either a placebo or 250 mg of Wellmune WGP daily for 10 days.

The athletes then rode an exercise bicycle for one hour in the heat stress chamber. Blood samples were drawn at day 0 and immediately before and after the exercise session and again two hours post exercise.

Using a cross-over study design, the athletes next observed an eight-day "wash out" period before repeating the study with the other test variable (Wellmune or placebo).



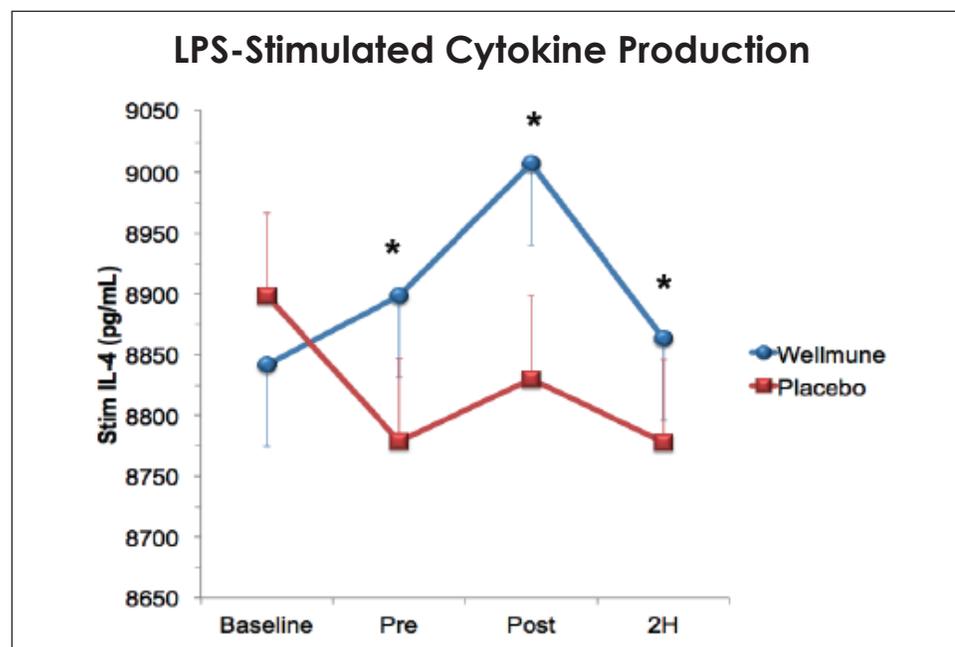
# Wellmune WGP Reduces Immune Suppression Associated with Strenuous Exercise

This clinical study conducted at the Department of Health and Human Performance at the University of Houston indicates that Wellmune WGP® may enable both recreational and elite athletes to exercise longer and harder with less risk of immune system suppression that normally follows high-intensity exercise.

The effectiveness of the immune system drops sharply below its normal state two to six hours after strenuous exercise and then gradually recovers within 24 hours. "During this 'open window' period, the athlete is more susceptible to infection, which may result in lost training time as well as missed work or school," said Brian McFarlin, Ph.D., FACSM, Associate Professor of Exercise Physiology, Nutrition, and Immunology.

Study participants also had higher levels of key cytokines (IL-2, IL-4, IL-5 and IFN gamma) following Lipopolysaccharide (LPS) stimulation when taking Wellmune WGP. LPS is derived from gram-negative bacteria and used to mimic a foreign challenge to stimulate an immune response.

"The effect of Wellmune WGP on LPS-stimulated IL-4 and IL-5 production suggests that leukocytes were primed for higher plasma cytokines that directly mediate innate and humoral-dependent immune responses," said Dr. McFarlin. "Our lab has tested numerous compounds but Wellmune is the first to prevent alterations in monocytes and key cytokines following high-intensity exercise."



(\*) Indicates statistically significant difference ( $P < 0.05$ ) between Wellmune WGP and placebo.

"Baker's Yeast  $\beta$ -glucan Supplementation Increases Monocytes and Cytokines Post-Exercise: Implications for Infection Risk?" (2012) *British Journal of Nutrition*. May 10:1-9.

### Study #3: Med Students



In contrast with the placebo group, participants taking Wellmune WGP reported a significant reduction (18%) in the total number of days with self-reported URTI symptoms (198 days vs 241 days,  $p=0.039$ ).

## Wellmune WGP Reduced Duration of Cold/Flu Symptoms in Study of 100 Medical Students

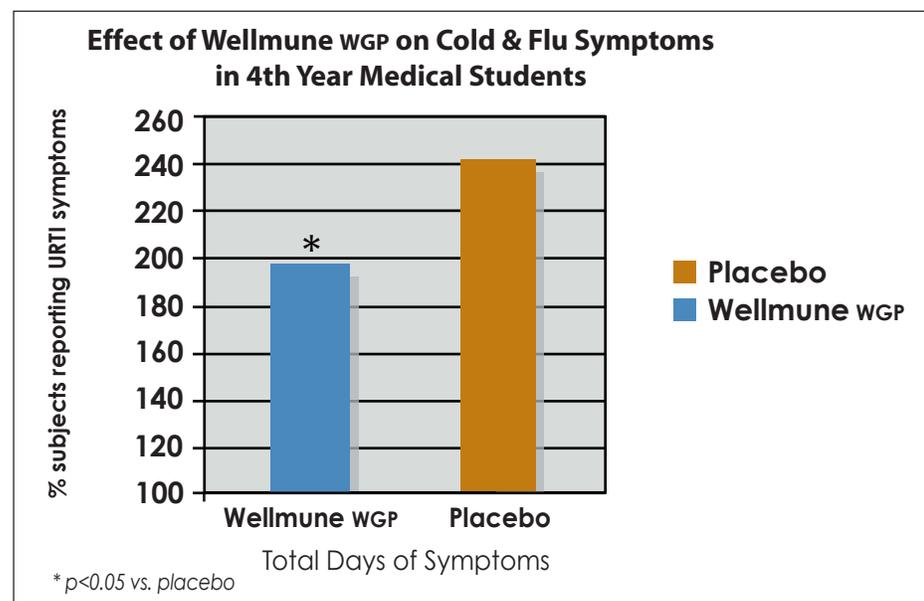
Wellmune WGP significantly reduced the duration of upper respiratory tract infection (URTI) symptoms in a healthy population of 100 medical students during a 90-day study at the peak of the cold-flu season.

One hundred fourth-year medical students at Southampton University Medical School, United Kingdom, participated in the randomized, double-blind, placebo-controlled study. The students consumed 250 mgs of Wellmune WGP once daily or an identical placebo capsule.

Participants completed a daily health diary recording presence or absence of listed URTI symptoms. Two or more reported URTI symptoms for two consecutive days triggered medical assessment and cytokine analysis within 24 hours. A total of 97 participants completed the trial protocol (Wellmune WGP  $n=48$ , Placebo  $n=49$ ).

### Study Results

- There was a significant reduction (18%) in the total number of days with self-reported URTI symptoms in Wellmune WGP group compared to placebo (198 days versus 241 days,  $p=0.039$ ).
- In total, 24 episodes of URTI were medically confirmed; 12 episodes in each group.
- Wellmune WGP did not induce inflammatory cytokines. No cytokine change was seen during symptomatic URTI between study groups.



"Influence of yeast-derived 1,3/1,6 glucopolysaccharide on circulating cytokines and chemokines with respect to upper respiratory tract infections." *Nutrition* 28:665-669.

## Study #4: Lifestyle Stress



In contrast with the placebo group, participants taking Wellmune WGP reported a:

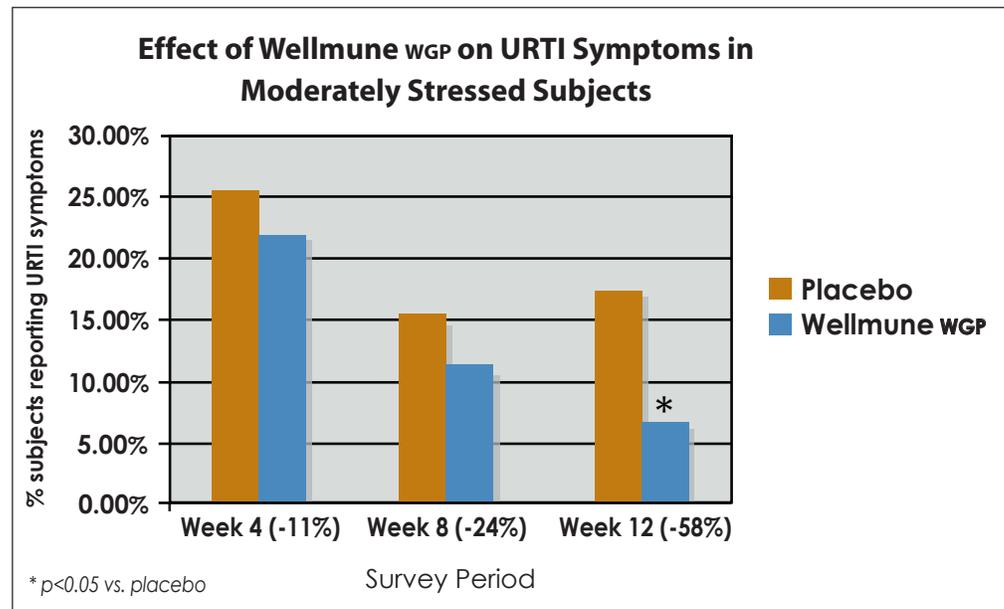
- 58% decrease in upper respiratory tract infection symptoms
- 9.5% increase in overall well-being
- 11% increase in vigor

# Wellmune WGP Reduced Upper Respiratory Tract Infection Symptoms during 90-Day Lifestyle Stress Study

In a study of 122 healthy volunteers (32 men, 90 women  $38 \pm 12y$ ), participants taking 250 mgs of Wellmune WGP daily for 12 weeks reported a statistically significant ( $p < 0.05$ ) 58% reduction in upper respiratory tract infection symptoms, compared with individuals taking a placebo. This data was presented at Experimental Biology 2010.

Using a Profile of Mood States (POMS) psychological survey to assess changes in mental and physical energy levels and overall well-being, the study demonstrated statistically significant benefits for the Wellmune WGP group. These participants rated their overall well-being and vigor 9.5% and 11% higher, respectively, compared with the placebo group. Data for both measures had p values of  $< 0.05$ .

The study results were consistent with data from other clinical studies demonstrating that Wellmune WGP can naturally enhance immune responses during periods of both high physical and psychological stress.



"Baker's Yeast Beta-Glucan Supplement Reduces Upper Respiratory Symptoms and Improves Mood State in Stressed Women." *Journal of the American College of Nutrition*, August 2012, vol 31, no. 4, 295-300.

## Study #5: Lifestyle Stress



Compared with the placebo group, the Wellmune WGP group reported a:

- 42% increase in vigor
- 38% reduction in fatigue
- 19% reduction in tension
- 15% reduction in stress-induced confusion

Subjects completed the Profile of Mood States (POMS) Survey Instrument. The well-validated POMS employs 65 adjective-based indicators of mood scaled for intensity (0-4); specific combinations of the adjectives define the 6 mood state factors: tension, vigor, fatigue, confusion, anger and depression.

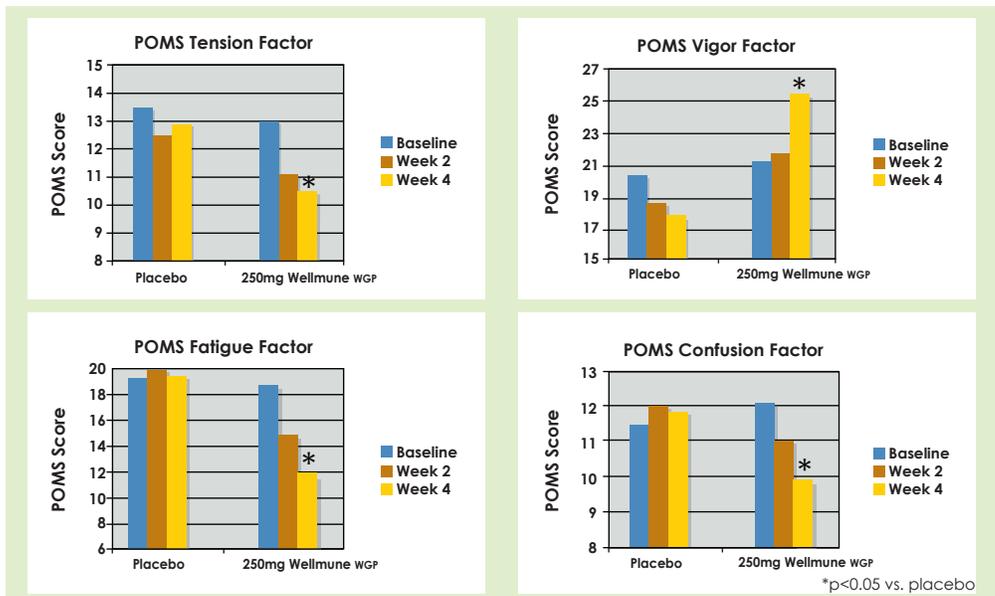
# Wellmune WGP Reduced Health Challenges in High Lifestyle Stress Subjects

Individuals with high lifestyle stress taking Wellmune WGP over four weeks reported a significant increase in their general health, compared with the placebo group. Fully 150 subjects with high lifestyle stress were randomized, double blinded and placebo controlled. Subjects were split into two groups: placebo and 250 mgs/day of Wellmune WGP. Subjects maintained a daily health log with entries tracking the occurrence and duration of URTI symptoms (cough, sore throat, sneezing, etc.). They also responded to questions regarding physical health during the course of study.

**Table 1. Effect of Wellmune WGP treatment or placebo on physical health of subjects reporting moderate to high lifestyle stress over two- and four-week monitoring periods.**

		Placebo	250 mgs/day Wellmune WGP
<b>Q1</b> - During the course of the supplement regimen my health has been... (1 = worse, 10 = better)	End of 2 weeks	4.3±1.0	6.2±1.2
	End of 4 weeks	4.6±1.0	6.5±1.1
<b>Q2</b> - At the END of this 2-week period how would you rate your overall health... (1 = worse, 10 = better)	End of 2 weeks	5.0±1.2	6.9±1.6
	End of 4 weeks	5.3±1.4	7.1±1.7
Reported symptoms (headache, thirst, tiredness, weakness, fatigue, runny nose, nasal congestion, itchy nose, sneezing, coughing, sore throat, general aches)	End of 2 weeks	16 subjects	5* subjects
	End of 4 weeks	14 subjects	4* subjects

\*p<0.05 vs. placebo



**Figure 1.** Analyzed data for specific POMS factors calculated from POMS Score Sheet. Data analysis was by paired t-test. A value of p < 0.05 was considered significant. Each factor was determined using answers to specific adjective-based scales as described in Profile of Mood States manual by McNair et al (28).



“Beta 1,3/1,6 Glucan Decreases Upper Respiratory Tract Infection Symptoms and Improves Psychological Well-being in Moderate to Highly-Stressed Subjects.”  
Agro Food Industry Hi-Tech (2010). 21:21-24.

## Study #6: Allergy Study



Allergy sufferers taking Wellmune WGP experienced a 27% reduction in average allergy symptoms and a 52% reduction in severity of symptoms.

# Wellmune WGP Provided Significant Relief to Ragweed Allergy Sufferers

A placebo-controlled, double-blinded study found that Wellmune WGP® reduced allergy symptoms and improved the quality of life of individuals who suffer from ragweed allergy. Ragweed is a leading cause of seasonal allergy symptoms and affects 36 million Americans. Typical symptoms include nasal congestion, sneezing, itchy eyes and difficulty breathing. The cause is an immune system overreaction to ragweed pollen.

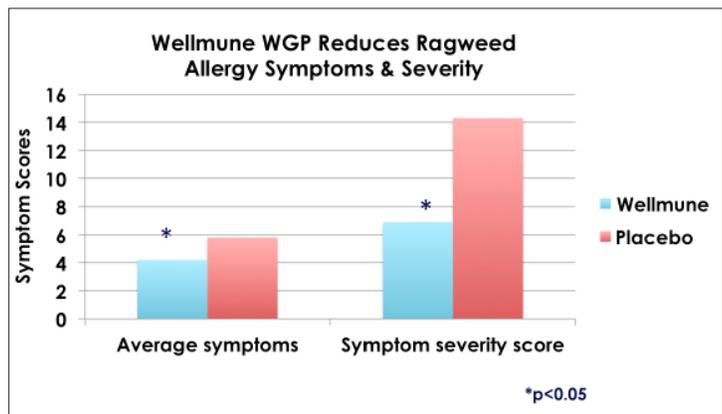
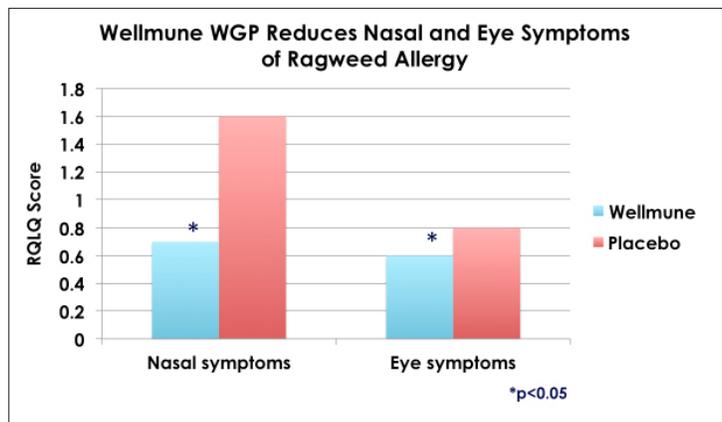
### Study Design

The study equally divided 48 healthy subjects (31 female, 17 male; 39 ± 13 years of age) into two groups. One group consumed a placebo while the other a 250 mg serving of Wellmune WGP daily for four weeks during September/October 2010 in an area of south-east Ohio where local pollen counts were high. Allergy surveys, including the validated Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ), were used to assess differences in allergy symptoms.

### Study Results

Individuals consuming Wellmune WGP experienced statistically significant ( $p < 0.05$ ) relief by several measures:

- A 27% reduction in average allergy symptoms and 52% reduction in severity of symptoms.
- Reductions in key nasal and eye-related allergy symptoms.
- Overall results demonstrated a 56% improvement on the Quality of Life Index, a scientifically validated tool for measuring how participants rate their overall sense of wellness.



"β-Glucan supplementation, allergy symptoms, and quality of life in self-described ragweed allergy sufferers." *Food Science & Nutrition*. doi: 10.1002/fsn3.11

## Study #7: CA Marathoners



In contrast with the placebo group, marathoners taking Wellmune WGP reported a:

- 67% decrease in upper respiratory tract infection symptoms
- 22% increase in vigor
- 48% reduction in fatigue
- 38% reduction in tension
- 38% reduction in confusion

Subjects completed the Profile of Mood States (POMS) Survey Instrument. The well-validated POMS employs 65 adjective based indicators of mood scaled for intensity (0-4); specific combinations of the adjectives define the 6 mood state factors: tension, vigor, fatigue, confusion, anger and depression.

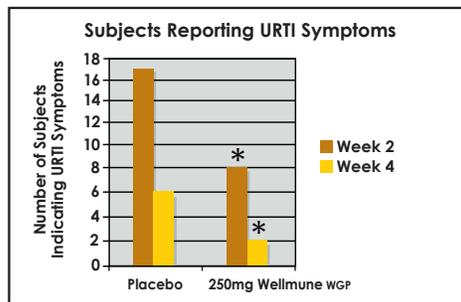


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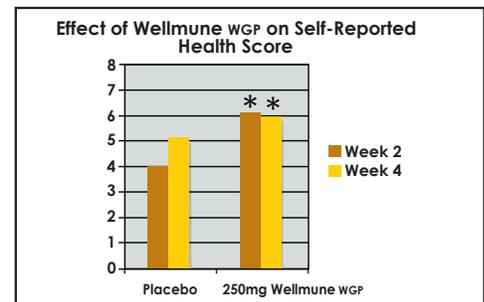
# Wellmune WGP Reduced Fatigue and Improved Health in Marathoners

Wellmune WGP increased vigor and mental clarity while reducing fatigue and upper respiratory tract infection (URTI) symptoms in marathon runners. The double-blind, placebo-controlled study included 75 marathon runners (35 men, 40 women) ages 18-53 (mean age 36 years) who were recruited at the 2007 Carlsbad Marathon in California. Subjects were treated daily with Wellmune WGP, a natural carbohydrate that activates key immune cells to more quickly recognize and kill foreign challenges, or a placebo for four weeks.

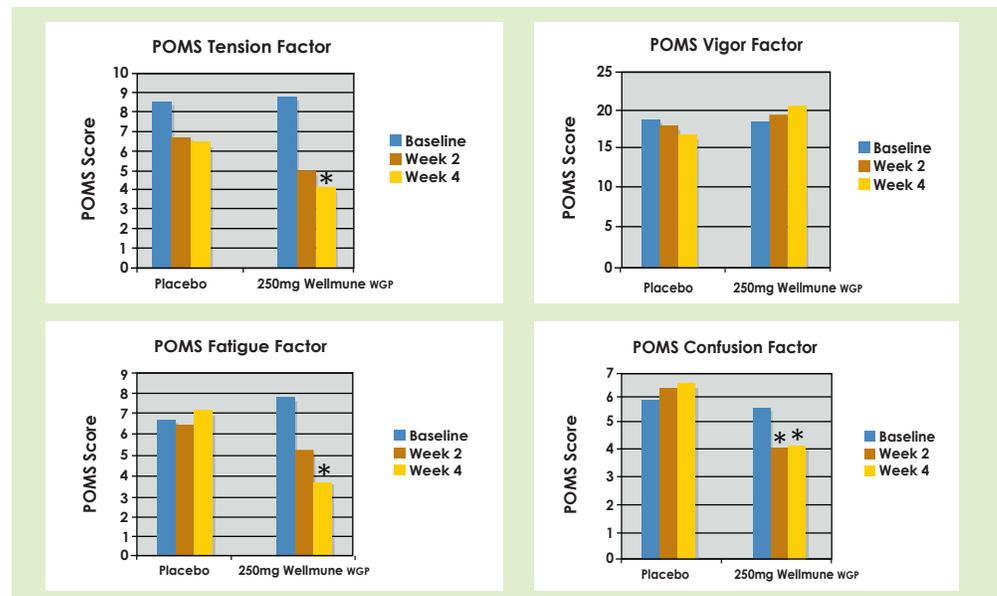
The protocol of this study was identical to the study completed with high lifestyle stress subjects (page 10).



**Figure 1.** Total number of subjects reporting any of 11 pre-selected upper respiratory tract infection symptoms. Subjects were orally administered placebo, 250 mg Wellmune WGP or 500 mg Wellmune WGP. Statistical analysis was by paired t-tests. \*A value of  $p \leq 0.05$  was considered significant.



**Figure 2.** Subjects responded to two and four week supplement effectiveness question: "During the course of the supplement regimen, my health has been..." Scores for the question were based on a scale of 0-10 with 0 being worse, 5 being same and 10 being better health. Data analysis was by paired t-test. \*A value of  $p \leq 0.05$  was considered significant.



**Figure 3.** Analyzed data for specific POMS factors calculated from POMS Score Sheet. Data analysis was by paired t-test. A value of  $p < 0.05$  was considered significant. Each factor was determined using answers to specific adjective-based scales as described in Profile of Mood States manual by McNair et al (28).

"Effect of Beta 1,3/1,6 Glucan on Upper Respiratory Tract Infection Symptoms and Mood State in Marathon Athletes." *Journal of Sports Science and Medicine* (2009). 8:509-515.

## Study #8: Cold & Flu



Compared with the placebo group, the Wellmune WGP group reported:

- No incidence of fever compared with 3.5 incidences over a 90-day period
- No need to take a “sick day” from work or school, compared with 1.38 days of work/school missed for the placebo group
- An increase in general health, including physical energy and emotional well-being



# Wellmune WGP Maintained Physical Health and Reduced ‘Down Time’ During 90-Day Study

In a cold season study with 40 healthy subjects, Wellmune WGP reduced the incidence of fever and eliminated the need to miss work or school due to cold-like symptoms. The double-blinded, placebo-controlled study included subjects, aged 18-65, who were treated daily with either 500mg of Wellmune WGP or a placebo for 90 days.

In contrast with the placebo group, the Wellmune WGP group reported an increase in general health markers, including physical energy and emotional well-being, as measured by a clinically validated health survey questionnaire (SF-36v-2).

In addition, although there were no differences between groups in the number of colds, at the end of the 12-week test period the Wellmune WGP-supplemented group exhibited significant improvements in Physical Component Summary scores as defined in the SF-36v-2 health survey.

Subjects self-administered the SF-36 Quality of Life Questionnaire. The SF-36 consists of eight scaled scores, which are the sums of the questions in their section. Each scale is directly transformed into a 0-100 scale on the assumption that each question carries equal weight. The eight sections are: vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning, and mental health.

### SF-36 Quality of Life Questionnaire

Variable	Wellmune	Placebo	P-value
General Health - day 0	59.7 ± 4.5	57.0 ± 5.3	0.147
General Health - day 90	58.7 ± 7.0	52.0 ± 14.6	0.038
Physical Health Summary - day 0	56.7 ± 4.5	57.3 ± 2.3	0.576
Physical Health Summary - day 90	57.5 ± 4.5	55.5 ± 3.5	0.029

### Medically-verified Symptoms and Study Outcomes

Variable	Wellmune	Placebo	P-value
Incidence of Fever	0.00	3.5 ± 3.42	0.042
Number of missed days of work/school	0.00	1.38 ± 1.25	0.026

“Randomized Phase II Clinical Trials of Wellmune WGP® for Immune Support During Cold and Flu Season.” *The Journal of Applied Research* (2009). 9:20-42.

## Study #9: Firefighters



# Wildland Firefighters Reported Improved Health with Wellmune WGP

A study conducted by the University of Montana, with funding from Biothera and the U.S. Air Force, found that wildland firefighters benefited from Wellmune WGP.

In a single-blind, random cross-over design, subjects completed two 14-day conditions with a three-day washout between trials. Supplements were consumed once a day and consisted of Immune Health Basics® and a similar capsule placebo.

In comparison with the control group, Wellmune WGP subjects experienced a:

- 23% reduction in upper respiratory tract infection symptoms (p value = 0.06)
- Dramatic improvement in overall physical health (p value = 0.006)

Subjects completed a daily health questionnaire as used by Nieman et al. (2002), with additional questions added that pertained specifically to the supplement.

An individual was classified as having an URTI when he or she recorded a cold or flu symptom for a minimum of two consecutive days.

At the conclusion of each trial, subjects completed an overall health performance questionnaire, which contained questions regarding the subject's overall health during the 14-day trial.



"Effects of an Immunomodulating Supplement on Upper Respiratory Tract Infection Symptoms in Wildland Firefighters." *Medicine & Science in Sports & Exercise*. 40(5):S353.

# Biothera Research

Research supporting the safety and efficacy of Biothera ingredients is the subject of numerous peer-reviewed science and medical journal articles and presentations at scientific forums. Abstracts of these articles are available at [www.wellmune.com](http://www.wellmune.com).

## Clinical Research

McFarlin, B., Carpenter, K., Davidson, T., McFarlin, M., "Baker's Yeast Beta Glucan Supplementation Increases Salivary IgA and Decreases Cold/Flu Symptomatic Days After Intense Exercise." *Journal of Dietary Supplements*, Early Online:1-13, 2013. Available online at [www.informahealthcare.com/jds](http://www.informahealthcare.com/jds) DOI: 10.3109/19390211.2013.820248.

Carpenter, K.C., Breslin, W.L., Davidson, T., Adams, A., McFarlin, B.K. 2012. "Baker's Yeast  $\beta$ -glucan Supplementation Increases Monocytes and Cytokines Post-Exercise: Implications for Infection Risk?" *British Journal of Nutrition*. May 10:1-9.

Fuller, R., Butt, H., Noakes, P., Kenyon, J., Yam, T.S., Calder, P., 2012. Influence of yeast-derived 1,3/1,6 glucopolysaccharide on circulating cytokines and chemokines with respect to upper respiratory tract infections. *Nutrition* 28: 665-669.

Talbott, S., Talbott, J., Talbott, T., Dingler, E. 2012.  $\beta$ -Glucan supplementation, allergy symptoms, and quality of life in self-described ragweed allergy sufferers. *Food Science & Nutrition* .doi: 10.1002/fsn3.11.

Talbott, S., Talbott, J. 2012. Baker's Yeast Beta-Glucan Supplement Reduces Upper Respiratory Symptoms and Improves Mood State in Stressed Women. *Journal of the American College of Nutrition*, August 2012, vol 31, no. 4, 295-300.

Talbott S., Talbott J. 2010. Beta 1,3/1,6 Glucan Decreases Upper Respiratory Tract Infection Symptoms and Improves Psychological Well-being in Moderate to Highly-Stressed Subjects. *Agro Food Industry Hi-Tech*. 21:21-24.

Harger-Domitrovich, S. G.; Domitrovich, J. W.; Ruby, B. C. 2008. Effects of an immunomodulating supplement on upper respiratory tract infection symptoms in wildland firefighters. *Medicine & Science in Sports & Exercise*. 40(5):S353.

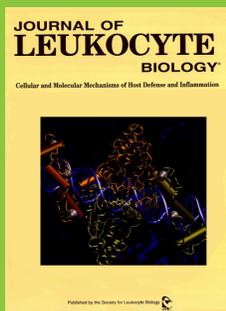
Feldman, S., Schwartz, H., Kalman, D., Mayers, A., Kohrman, H., Clemens, R. and Krieger, D. 2009. Randomized Phase II Clinical Trials of Wellmune WGP® for Immune Support During Cold and Flu Season. *The Journal of Applied Research*. 9:20-42.

Talbott S., Talbott J. 2009. Effect of Beta 1, 3/1, 6 Glucan on Upper Respiratory Tract Infection Symptoms and Mood State in Marathon Athletes. *Journal of Sports Science and Medicine*. 8:509-515.

Wellmune improves NK cell activity in subjects with cold -- report available.

Wellmune improves general immune health biomarkers -- report available.





## Preclinical Research

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### **Baker's Yeast Beta Glucan Analysis**

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