

MANNATECH PRODUCT HUMAN CLINICAL STUDIES AND APPROVED CLAIMS[†]



[†]Selected claims herein are backed by science, compliant with U.S. Food and Drug Administration (FDA) and Federal Trade Commission (FTC) regulations and applicable in the U.S., South Africa and China. Complete lists of approved claims are posted on mannatechscience.org. Studies were typically at least partially funded by Mannatech. In some cases, this means that Mannatech donated the product that was studied. In other cases, additional funding was provided.

MANNATECH PRODUCT HUMAN CLINICAL STUDIES AND APPROVED CLAIMS

TABLE OF CONTENTS

	PAGE
AMBROTOSE® COMPLEX/ADVANCED AMBROTOSE® POWDERS	
Ambrotose Complex/Advanced Ambrotose Powders: Double-blind, Placebo-controlled Trials	
Best T, Howe P, Bryan J, Buckley J, Scholey A (2015) Acute effects of a dietary non-starch polysaccharide supplement on cognitive performance in healthy middle-aged adults. <i>Nutr Neurosci</i> 18(2):76-86.	4
Best T, Kemps E, Bryan J (2012) Perceived changes in well-being following polysaccharide intake in middle-aged adults. <i>Applied Res Qual Life</i> , 7(2):163-82.	4
Best T, Kemps E, Bryan J (2010) Saccharide effects on cognition and well-being in middle-aged adults: A randomized controlled trial. <i>Developmental Neuropsychology</i> 35(1):66-80.	5
Stancil AN, Hicks LH (2009) Glyconutrients and perception, cognition, and memory. <i>Perceptual Mot Skills</i> 10:259-270.	5
Best T (2008) An investigation of saccharide effects on memory performance. <i>J Nutr, Health and Aging</i> 12(9)657-662.	6
Wang C, Szabo JS, Dykman RA (2004) Effects of a carbohydrate supplement upon resting brain activity. <i>Integr Physiol Behav Sci</i> 39:126-138.	6
Wang C, Pivik RT, Dykman RA (2002) Effects of a glyconutritional supplement on brain potentials associated with language processing. <i>Federation Proceedings: Experimental Biology Meeting</i> , New Orleans, Louisiana. April 20-24.	6
Ambrotose Complex/Advanced Ambrotose Powders: Open-label Trial	
Alavi A, Fraser O, Tarelli E, Bland M, Axford J. (2011) An open-label dosing study to evaluate the safety and effects of a dietary plant-derived polysaccharide supplement on the N-glycosylation status of serum glycoproteins in healthy subjects. <i>Eur J Clin Nutr</i> , 1-9.	7
Ambrotose Complex/Advanced Ambrotose Powders: Selected Approved Product Claims	
	8
AMBROTOSE AO® CAPSULES	
Ambrotose AO Capsules: Double-blind, Placebo-controlled Trial	
	10
Ambrotose AO Capsules: Open-label Trials	
Myers SP, Stevenson L, Cheras PA, et al. (2010) A forced titration study of the antioxidant and immunomodulatory effects of Ambrotose AO supplement. <i>BMC Comp Alt Med</i> 10, doi: 10.1186/1472-6882-10-16.	11
Boyd S, Gary K, Koepke, et al. (2003) An open-label pilot study of the antioxidant effect in healthy people of Ambrotose AO. <i>GlycoScience & Nutrition</i> 4:1-6	11
Ambrotose AO Capsules: Selected Approved Product Claims	
	12
BOUNCEBACK® CAPSULES	
BounceBack Capsules: Double-blind, Placebo-controlled Trial	

Udani J, Singh B, Singh V (2009) BounceBack capsules for reduction of DOMS after eccentric exercise: a randomized, double-blind, placebo-controlled, crossover pilot study. <i>J Int Soc Sports Nutr</i> 6(14):1-6.	14
BounceBack Capsules: Selected Approved Product Claims	15
EM●PACT® SPORTS DRINK	
EM●PACT Sports Drink: Double-blind, Placebo-controlled Trials	
Byars A, Keith S, Simpson W, et al. (2010) The influence of a pre-exercise sports drink (PRX) on factors related to maximal aerobic performance. <i>J Int Soc Sports Nutr</i> 7:1-6.	17
Byars A, Greenwood MGL (2006) The effectiveness of a pre-exercise performance drink (PRX) on indices of maximal cardiorespiratory fitness. <i>J Int Soc Sports Nutr</i> 3: 56-59.	17
EM●PACT Sports Drink: Approved Product Claims	18
OSOLEAN® FAT LOSS POWDER	
OsoLean Fat Loss Powder: Double-blind, Placebo-controlled Trial	
Frestedt JL, Zenk JL, Kuskowski MA et al. (2008) A whey-protein supplement increases fat loss and spares lean muscle in obese subjects: a randomized human clinical study. <i>Nutr Metab (Lond)</i> 5(8):1-17.	19
OsoLean Fat Loss Powder: Open-label Trial	
Sinnott RA, Maddela RL, Nelson ED, et al. (2009) The modifying effects of a calcium-rich whey protein supplement (OsoLean® Powder) on weight loss and waist circumference in overweight subjects: a preliminary study. <i>Open Nutraceuticals J</i> 2:36-41.	19
OsoLean Fat Loss Powder: Selected Approved Product Claims	20
MULTIPLE PRODUCTS [AMBROTOSE COMPLEX POWDER, OMEGA-3 WITH VITAMIN D₃ CAPSULES, AMBROTOSE AO CAPSULES, PHYTOMATRIX® CAPLETS, PLUS™ CAPLETS]	
Multiple products: Open-label trial	
Sinnott RA, Maddela RL, Bae S, Best T. (2013) The effect of dietary supplements on the quality of life of retired professional football players. <i>Global J Health Sci</i> 2(5):13-26.	22

AMBROTOSE COMPLEX/ADVANCED AMBROTOSE POWDERS
RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIALS



1. Best T, Howe P, Bryan J, Buckley J, Scholey A (2015) Acute effects of a dietary non-starch polysaccharide supplement on cognitive performance in healthy middle-aged adults. *Nutr Neurosci* 18(2):76-86.



Dr. Talitha Best

In a randomized, double-blind, placebo-controlled trial of 73 healthy middle-aged adults, Dr. Talitha Best and colleagues from the University of South Australia (UniSA; Adelaide, South Australia) and Swinburne University of Technology (Melbourne, Victoria) showed that, shortly after taking a single 4 gram serving of Ambrotose powder, subjects experienced significantly improved memory and performed significantly better on demanding cognitive tasks. The product had no effect on blood glucose levels.

<http://www.tandfonline.com/doi/abs/10.1179/1476830513Y.0000000101?journalCode=yyns20>

2. Best T, Kemp E, Bryan J (2012) Perceived changes in well-being following polysaccharide intake in middle-aged adults. *Applied Res Qual Life*, 7(2):163-82.

Dr. Best and colleagues from UniSA and Flinders University (Adelaide) showed, in a 12-week randomized, double-blind, placebo-controlled trial of more than 100 healthy adults, that individuals who consumed 3.6 g/day Ambrotose powder reported numerous health and well-being benefits.

Gastrointestinal effects were among the perceived benefits reported by individuals who consumed Ambrotose powder.

<https://link.springer.com/article/10.1007/s11482-011-9158-2>

3. Best T, Kemps E, Bryan J (2010) Saccharide effects on cognition and well-being in middle-aged adults: A randomized controlled trial. *Developmental Neuropsychology* 35(1):66-80.

Dr. Best and colleagues at Flinders University showed, in a 12-week randomized, double-blind, placebo-controlled trial of 109 healthy middle-aged adults, that intake of 3.6 grams/day Ambrotose powder significantly improved memory and improved psychological well-being.

<http://www.tandfonline.com/doi/abs/10.1080/87565640903325709?journalCode=hdvn20>

4. Stancil AN, Hicks LH (2009) Glyconutrients and perception, cognition, and memory. *Perceptual Mot Skills* 10:259-270.



Howard University

Drs. Atiya N. Stancil and Leslie H. Hicks at Howard University (Washington, D.C., USA) showed, in a randomized, double-blind, placebo-controlled trial of 62 healthy young adults, that intake of a single one-tablespoon serving of Ambrotose significantly improved cognitive function (as measured by improvements in visual discrimination and working memory).

<https://www.ncbi.nlm.nih.gov/pubmed/19425467>

5. Best T (2008) An investigation of saccharide effects on memory performance. *J Nutr, Health and Aging* 12(9)657-662.

Dr. Best showed, in a double-blind, placebo controlled trial of 45 middle-aged adults, that a single 7 gram serving of Ambrotose powder demonstrated the potential for improving memory.

<https://www.ncbi.nlm.nih.gov/pubmed/18953465>

6. Wang C, Szabo JS, Dykman RA (2004) Effects of a carbohydrate supplement upon resting brain activity. *Integr Physiol Behav Sci* 39:126-138.

Drs. Chenghua Wang (Rotman Research Institute, Toronto, Canada), Joanne Szabo (University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA) and Roscoe Dykman (Arkansas Children's Nutrition Center, Little Rock) showed, in a randomized, double-blind, placebo-controlled trial of 20 healthy adults, that a one tablespoon serving of Ambrotose powder had a significant positive impact on indicators of cognitive function (i.e., enhanced brainwave frequencies known to be associated with attention and alertness).

<https://www.ncbi.nlm.nih.gov/pubmed/15759600>

7. Wang C, Pivik RT, Dykman RA (2002) Effects of a glyconutritional supplement on brain potentials associated with language processing. *Federation Proceedings: Experimental Biology Meeting*, New Orleans, Louisiana. April 20-24.

Drs. Wang and R.T. Pivik at the University of Arkansas showed, in randomized, double-blind, placebo-controlled trial of 20 healthy young adult males, that a one tablespoon serving of Ambrotose had a significant positive effect on indicators of cognitive function (i.e., brain waves associated with information processing).

<http://mannatechscience.org/wp-content/uploads/files/publications/wang2.pdf>

AMBROTOSE COMPLEX/ADVANCED AMBROTOSE POWDERS
OPEN-LABEL TRIAL

Alavi A, Fraser O, Tarelli E, Bland M, Axford J. (2011) An open-label dosing study to evaluate the safety and effects of a dietary plant-derived polysaccharide supplement on the N-glycosylation status of serum glycoproteins in healthy subjects. *Eur J Clin Nutr*, 1-9.



Dr. Azita Alavi

In an open-label human dosing study of 12 healthy adults, Dr. Azita Alavi, a Research Fellow at the Sir Joseph Hotung Centre for Musculoskeletal Disorders, Division of Cellular and Molecular Medicine, St. George's University of London (U.K.) and colleagues showed that intake of 1.3-5.2 g/day Ambrotose for 7 weeks by healthy adults significantly impacted a potential indicator of cellular communication (i.e., caused a shift towards increased sialylation in the N-glycosylation profile of the serum). To the author's knowledge, this is the first study which has shown that dietary changes can affect serum glycosylation profiles. Co-authors included St. George's University researchers Professor John Axford, Dr. Edward Tarelli and Dr. Owen Fraser, and Professor Martin Bland, Department of Health Sciences, University of York (U.K.).

<https://www.nature.com/ejcn/journal/v65/n5/full/ejcn2010263a.html>

AMBROTOSE COMPLEX/ADVANCED AMBROTOSE POWDERS
SELECTED APPROVED PRODUCT CLAIMS (4 GRAMS/DAY)‡



Quality and Safety

- NSF-certified
- Gluten-free
- Low glycemic
- Free from soy, dairy, artificial flavors, artificial colors, MSG, preservatives
- Naturally sourced
- Kosher

Cellular Communication Benefits

- Supports cellular communication*
- Sugars attached to proteins (glycoproteins) serve as signals in cellular communication, thus influencing processes involved in inflammation and immunological reactions.*
- Glycosylation is the enzymatic process that attaches sugars (glycans) to proteins, lipids, or other organic molecules. These attached sugars can be structural and/or functional. In their functional role, they serve as antennae, interacting with cellular receptors and thus affecting cellular processes.*
- Glycosylation is a key post-translational protein modification that can significantly affect the overall biophysical and biochemical functions of proteins.*
- The function of glycoproteins is profoundly affected by their component sugars.*

Immune System Benefits

- Ambrotose powders can enhance the body's immune response to vaccinations against bacterial infections*
- Can enhance your body's response to vaccinations*
- Stimulates the immune system*
- Safe and natural daily supplement for year-round immune system-support*
- Take Ambrotose powder regularly for year round immune system support, especially during the winter months when our immune systems are particularly challenged*
- May enhance the body's ability to respond to pathogens*
- Modulates and supports your body's immune response*
- May improve overall wellness*
- Supports the body's natural immune response*
- In a clinical trial, intake of polysaccharides in Ambrotose powder was shown to support the body's natural defenses to help people stay healthy*
- Contains a standardized amount of high molecular weight acetylated mannans

Cognitive

- Improves mood*
- Improves memory*
- Enhances brain function*

- Enhances cognitive function*
- Improves well-being*
- May improve quality-of-life*
- Prevents mental stress*
- Reduces cognitive fatigue*
- May decrease irritability*

Gastrointestinal/Prebiotic

- Prebiotic dietary supplement
- Supports the growth of good gut bacteria*
- Helps promote gastrointestinal health*
- Helps support proper digestive system function*
- Ambrotose powders increase the number of beneficial bacterial in the gut*
- GI tract bacteria, such as *Lactobacilli* and *Bifidobacteria*, are important for GI health*
- GI tract bacteria decrease the growth of pathogenic bacteria and increase production of short chain fatty acids in the gut, both of which are believed to be positive for GI health. *Lactobacilli* and *Bifidobacteria* are bacteria known to be important for GI tract health*
- Ambrotose powders have been found to have a bifidogenic and lactobacillogenic effect, increasing the number of these beneficial bacteria*
- Research using a state-of-the-art simulation of the human gastrointestinal tract showed that Ambrotose powders can increase the numbers of the beneficial bacteria Bifidobacteria, as well as species belonging to Bacteroidetes, a phylum recently associated with body weight management*

‡ A complete list of approved claims is posted on mannatechscience.org.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

AMBROTOSE AO CAPSULES
DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL



1. Bloomer RJ, Canale RE, Blankenship MM, Fisher-Wellman KH. (2010) Effect of Ambrotose AO® on resting and exercise-induced antioxidant capacity and oxidative stress in healthy adults. *Nutrition Journal*, 9:49.



Richard Bloomer, PhD

In a 21-day randomized, double-blind, crossover trial of 25 healthy adults, scientists from the University of Memphis (Memphis, Tennessee, USA) showed that intake of 4 capsules/day Ambrotose AO significantly protected against oxidative stress (i.e., it increased two measures of antioxidant capacity in the blood: oxygen radical absorbance capacity [ORAC] and Trolox Equivalent Antioxidant Capacity [TEAC]).

<https://nutritionj.biomedcentral.com/articles/10.1186/1475-2891-9-49>

AMBROTOSE AO CAPSULES
OPEN-LABEL TRIALS

1. Myers SP, Stevenson L, Cheras PA, et al. (2010) A forced titration study of the antioxidant and immunomodulatory effects of Ambrotose AO supplement. *BMC Comp Alt Med* 10(16)1-16.



Professor Stephen Myers, PhD, BMed, ND

In a five-week open-label, dose-response study of 21 healthy adults, four capsules/day of Ambrotose AO was safe and provided antioxidant benefits, raising serum ORAC by 36.6%. The study was conducted by Dr. Stephen P. Myers and his colleagues from Southern Cross University in Lismore, Australia and The New Zealand Institute for Plant and Food Research Limited in Auckland, New Zealand.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2888736/>

2. Boyd S, Gary K, Koepke, et al. (2003) An open-label pilot study of the antioxidant effect in healthy people of Ambrotose AO . *GlycoScience & Nutrition* 4:1-6



Stephen Boyd, B.Sc., M.D., PhD

Mannatech scientists and an independent statistician showed, in a pilot 8-week dose-response study of 12 healthy adults, that two capsules/day Ambrotose AO increased serum ORAC by 37.4%.

AMBROTOSE AO CAPSULES
SELECTED APPROVED PRODUCT CLAIMS (2-4 CAPSULES/DAY)[‡]



Quality and Safety

- NSF-certified
- Gluten-free
- Suitable for vegans
- Free from dairy, preservatives
- Kosher
- Contains naturally sourced ingredients
- Patented formulation

Benefits

- An antioxidant is any substance that can inhibit oxidation and may protect the body from the effects of free radicals. Free radicals are highly reactive substances which may be generated in the body by lifestyle factors such as smoking, stress and an unhealthy diet.*
- Increases antioxidant activity in the blood*
- Helps counter the harmful effects of toxins, environmental stress, poor diet and daily physical and oxidative stress – all of which can damage cells, tissues and DNA*
- Provides antioxidant protection*
- Protects against free radicals*
- Protects fats from damage due to free radicals*
- Supports oxidative stress management*
- Help the body cope with the harmful effects of oxidative stress*
- Oxygen Radical Absorbance Capacity (ORAC) is a widely accepted standard method for assessing the impact of dietary factors on blood antioxidant status developed by scientists affiliated with the United States Department of Agriculture
- Increases blood serum ORAC values*
- The increase in serum ORAC following intake of Ambrotose AO has been consistently greater than the increase (13%) found in a separate study following the addition of five servings of fruits and vegetables to the diet
- Ambrotose AO supplementation has consistently exerted positive effects on serum antioxidant capacity in three independent clinical studies*
- Ambrotose AO supplementation has consistently shown effects on serum antioxidant capacity in several independent clinical studies. Two to 4 capsules a day have been shown to increase serum ORAC values an average of 32%, with a mean range of 22–37%*
- Trolox Equivalent Antioxidant Capacity (TEAC) is another accepted method for assessing the antioxidant status of blood
- No other dietary supplement has been shown in a published clinical study to significantly increase both serum ORAC and serum TEAC - two different measures of serum antioxidant capacity*

- Ambrotose AO is the only dietary supplement shown to increase the serum antioxidant measure TEAC* Four capsules/day AO increased serum TEAC by 19%*
- Supplements providing mixtures of sensibly-dosed antioxidant nutrients appear to be most effective at exerting antioxidant effects.
- A blend of antioxidant ingredients for maximum benefit*
- Includes a blend of water-soluble and fat-soluble antioxidants
- Rich in antioxidant vitamins C and E
- A blend of antioxidants with synergistic effects*
- One of the most effective supplements containing sensible of antioxidant nutrients on the market today*
- An excellent antioxidant supplement for those who can't fit those servings of fruit and vegetables into their day*
- Provides immune system support*
- Two to 4 capsules a day of Ambrotose AO have been shown to increase serum ORAC values from 22–37%*
- Ambrotose AO has been shown in a published clinical study to significantly increase serum antioxidant capacity using two different methods of measurement: ORAC and TEAC*
- For people interested in a safe supplement that has consistently increased serum ORAC in clinical studies, Ambrotose AO may be the best choice*
- A clinical study showed an increase in serum ORAC following the addition of 5 servings of fruits and vegetables to the daily diet. Supplementation with Ambrotose AO has also consistently increased ORAC in clinical studies.*

About competitor products

- Most supplements have only been tested in test-tube (*in vitro*) studies, which do not necessarily predict the ability of the supplementation to increase serum ORAC levels
- The safety of supplemental beta-carotene (≥ 20 mg/day), a vitamin A precursor, and/or high doses of vitamin E (≥ 400 IU/day), has been questioned
- Supplements including high-dose ascorbic acid have been ineffective at increasing serum ORAC
- High-dose ascorbic acid may exert pro-oxidant effects
- Multivitamins with high doses of ascorbic acid, vitamin E and other antioxidant nutrients have not significantly increased serum ORAC
- In one study, high-dose alpha-tocopherol (400 IU) *increased* serum ORAC
- High doses of alpha-tocopherol may have negative effects on health
- High-dose omega-3 fatty acid supplementation (4 g fish oil/day) has been ineffective at increasing serum ORAC
- High-dose beta-carotene supplements (20-30 mg/day) have been shown to exert negative health effects in smokers and individuals who drink alcohol
- Supplementation with MonaVie Active®, pycnogenol, or quercetin has not been shown to affect serum ORAC.

[‡] A complete list of approved claims is posted on mannatechscience.org.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

BOUNCEBACK CAPSULES
DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL



Udani J, Singh B, Singh V (2009) BounceBack capsules for reduction of DOMS after eccentric exercise: a randomized, double-blind, placebo-controlled, crossover pilot study. *J Int Soc Sports Nutr* 6(14):1-6.

Dr. Jay Udani (UCLA Geffen School of Medicine, Los Angeles, California, USA and Medicus Research LLC, Northridge, California), and Drs. Betsy Singh, Vijay Singh and Elizabeth Sandoval (Medicus Research LLC) showed, in a 30-day double-blind, placebo-controlled trial, that 10 healthy adults experienced significantly reduced pain and tenderness following eccentric exercise after supplementation with two capsules per day BounceBack.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2698827/>

BOUNCEBACK CAPSULES
SELECTED APPROVED PRODUCT CLAIMS (2/DAY)*



Quality/Safety

- NSF-certified
- Gluten-free
- Proprietary formula
- Suitable for vegans
- Free from dairy, preservatives, artificial colors
- Contains naturally sourced ingredients
- Those who are taking blood thinners such as warfarin should consult their doctor before taking BounceBack

Benefits

- Proprietary blend of proteolytic enzymes and phytosterols to help reduce soreness*
- Helps reduce soreness, pain and stiffness*
- Helps ease soreness related to inflammation*
- A proprietary blend designed to aid the body's natural recovery process*
- Supports cartilage health*
- Helps maintain optimal joint health*
- Provides immune system support*
- Provides antioxidant support
- Supports the maintenance of good health*
- When taken daily over time, BounceBack capsules have been shown in a double-blind, placebo-controlled clinical trial to reduce the muscle pain and discomfort associated with delayed-onset muscle soreness (DOMS)*†
- When taken daily over time, BounceBack capsules can reduce muscle pain and discomfort typically experienced 1-3 days after intensive physical activity or overexertion*
- When taken daily over time, BounceBack capsules can help you stay active by reducing muscle soreness and stiffness due to physical activity or overexertion*
- When taken daily over time, BounceBack capsules can improve muscle recovery after physical activity or overexertion, enabling you to feel better in the days following exercise*
- When taken daily over time, BounceBack capsules are designed to keep you active with less of the soreness and stiffness typically associated with physical activity or overexertion*
- When taken daily over time, BounceBack capsules are designed to keep you on the move and mobile.

- When taken daily over time, BounceBack capsules have been shown to increase "active" energy as well as reduce muscle soreness due to physical activity or overexertion*
- BounceBack capsules are a combination formula that, when taken daily over time, addresses muscle soreness and stiffness due to physical activity or overexertion and provides joint support*
- When taken daily over time, BounceBack capsules help make living an active lifestyle easier*
- When taken daily over time, BounceBack capsules can reduce muscle soreness and stiffness associated with physical activity*

*DOMS is muscle pain and discomfort experienced approximately 1-3 days after intensive physical activity or overexertion.

Importance of Physical Activity

- Adults typically become less physically active as they get older.
- Few older adults achieve the minimum recommended 30 or more minutes of moderate physical activity on five or more days per week.
- Increased physical activity can make you feel better and improve both physical and mental health and quality-of-life in older adults.
- Few factors contribute as much to successful aging as having a physically active lifestyle.
- Significant health benefits can be obtained by including a moderate amount of physical activity on most, if not all, days of the week.

‡ A complete list of approved claims is posted on mannatechscience.org.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

EM•PACT SPORTS DRINK
DOUBLE-BLIND, PLACEBO-CONTROLLED TRIALS



1. Byars A, Keith S, Simpson W, et al. (2010) The influence of a pre-exercise sports drink (PRX) on factors related to maximal aerobic performance. *J Int Soc Sports Nutr* 7:1-6.



Professor Allan Byars, PhD

Dr. Allan Byars and colleagues at Angelo State University, San Angelo, Texas, USA showed, in a double-blind, placebo-controlled crossover trial of 29 young adults, that a single serving of EMPACT sports drink significantly improved subjects' aerobic performance, as measured by improved maximal oxygen consumption (VO_{2max}), time to exhaustion and percentage estimated non-protein fat substrate utilization.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845094/>

2. Byars A, Greenwood MGL (2006) The effectiveness of a pre-exercise performance drink (PRX) on indices of maximal cardiorespiratory fitness. *J Int Soc Sports Nutr* 3: 56-59.

Dr. Byars and Drs. Mike and Lori Greenwood (Baylor University, Waco, Texas, USA) and Dr. Warren K. Simpson (Hardin-Simmons University, Abilene, Texas, USA) showed, in a randomized, placebo controlled, crossover trial of 24 healthy adults, that consumption of EMPACT prior to exercise significantly enhanced aerobic performance, as measured by VO_{2max} and time to exhaustion.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2129156/>

EM•PACT POWDER
SELECTED APPROVED PRODUCT CLAIMS[‡]



Quality

- Free from gluten, dairy and artificial sweeteners
- Stimulant free
- Safe for all ages, including children age 4 and older
- Suitable for vegans

Benefits

- Clinically shown to enhance cardiorespiratory fitness (VO_{2max} , a measure of maximal oxygen consumption and physical fitness)
- A unique synergistic blend of pure fructose crystals, medium chain triglycerides (MCTs) and amino acids that has been shown in three randomized, double-blind, placebo-controlled trials to help active adults enhance their performance and increase their exercise capacity
- Clinically proven to increase VO_{2max} , which means optimized performance
- When taken 20-30 minutes before exercise may improve athletic endurance
- Increases the capacity of human muscle to perform work during challenging physical activities and exercise
- Increases energy and endurance during periods of intense and extended activity
- Provides sustaining energy if consumed as recommended
- May enhance the body's ability to use oxygen during athletic exertion
- Taking EMPACT as recommended may enhance aerobic performance
- May enhance oxygen delivery during intense training and activity, increasing endurance
- Can help prevent work-out fatigue due to dehydration or carbohydrate depletion
- Includes fructose, a sugar that provides energy without causing as much of a spike in insulin levels as glucose or sucrose
- Includes MCTs that are readily broken down into short-chain, free-fatty acids that are used as fuel for muscles
- Of numerous nutritional strategies evaluated to lessen certain marathon-induced immune system problems, ingestion of carbohydrate beverages during intense and prolonged exercise has emerged as the most effective.
- Formulated to help prevent muscle soreness and cramping, help reduce lactic acid build-up, optimize ATP, lactic acid and anaerobic energy systems

[‡] A complete list of approved claims is posted on mannatechscience.org.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

OSOLEAN FAT LOSS POWDER
DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL



Frestedt JL, Zenk JL, Kuskowski MA et al. (2008) A whey-protein supplement increases fat loss and spares lean muscle in obese subjects: a randomized human clinical study. *Nutr Metab (Lond)* 5(8):1-17.

Drs. Joy Frestedt and John Zenk (Minnesota Applied Research Center, Edina, Minnesota, USA), Michael Kuskowski (Geriatric Research Education and Clinical Center, Minneapolis, Minnesota), and Loren Ward and Eric Bastian (Glanbia Research and Development Center, Twin Falls, Idaho, USA) conducted this 12-week randomized, double-blind, parallel-arm trial on healthy subjects on a restricted calorie diet. They showed that subjects who consumed a flavored and sweetened drink mix that contained the same peptide blend in OsoLean powder lost significantly more body fat and lost less lean muscle mass when compared with those consuming an isocaloric beverage.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2289832/>

OSOLEAN FAT LOSS POWDER
OPEN-LABEL TRIAL

Sinnott RA, Maddela RL, Nelson ED, et al. (2009) The modifying effects of a calcium-rich whey protein supplement (OsoLean® Powder) on weight loss and waist circumference in overweight subjects: a preliminary study. *Open Nutraceuticals J* 2:36-41.

In an 8-week open-label trial of over 67 overweight adults conducted by Mannatech scientists and an independent statistician, eight weeks of OsoLean powder consumption significantly increased weight loss and waist inches lost, significantly decreased body mass index (BMI) and appetite, and improved quality of life.

<https://benthamopen.com/ABSTRACT/TONUTRAJ-2-36>

OSOLEAN FAT LOSS POWDER:
SELECTED APPROVED PRODUCT CLAIMS (2 SERVINGS/DAY)[‡]



Quality and Safety

- All-natural
- No fillers
- No artificial ingredients
- No MSG, artificial flavors, artificial colors or preservatives
- Gluten-free
- Suitable for vegetarians
- Low glycemic
- Kosher
- Patented technology[†]
- Obtained from milk provided daily from local dairy farmers in Idaho and New Mexico. Each milk batch is tested thoroughly for antibiotics and other contaminants, and milk that does not meet high quality standards is rejected.

[†]Glanbia Nutritionals (Ireland) Ltd. is the patent holder for the peptide whey protein technology.

Benefits: Fat loss/inches loss/satiety

- Helps promote fat loss when combined with a reduced calorie diet and proper exercise*
- Helps you lose fat while maintaining lean muscle mass when combined with a reduced calorie diet and proper exercise*
- OsoLean curbs your appetite when combined with the OsoLean plan and proper exercise*
- Retention of lean muscle mass when burning fat is important in maintaining body strength
OsoLean includes whey protein and calcium from milk that, in a clinical test, promoted fat loss and minimized loss of muscle tissue when combined with a reduced calorie diet and proper exercise*
- Lose the Fat, Keep the Lean![†]
- Lose inches[‡]
- Live healthy and lose inches the all-natural way^{†*}
- OsoLean may help you lose inches from your waist when combined with a reduced calorie diet and proper exercise*

[‡]Individual results may vary

About OsoLean

- Clinically tested fat loss peptides
- Excellent source of high quality protein
- Rich source of branched-chain amino acids (BCAAs)
- Rich source of leucine, which is important for building muscle mass
- Contains fast-digesting milk protein

- Excellent source of calcium
- Contains sialic acid, a sugar found in glycoproteins
- Some studies suggest that whey proteins may be better than casein or soy proteins in supporting the development of lean muscle mass

The importance of adequate protein intake

- Older adults on calorie-restricted diets are at particular risk of losing muscle mass
- Athletes and older individuals may benefit from increased protein intake because both groups have increased needs for muscle protein synthesis
- In numerous studies, 20-25 g whey protein supplementation stimulated muscle protein synthesis
- According to a preliminary study of 17 healthy senior citizens, daily intake of 15 g whey protein for 8 weeks may help support the immune response to a vaccine
- Moderately increasing protein intake by consuming a daily protein supplement may help protect against muscle loss associated with aging
- Strength/Resistance-training athletes may require more daily intake of protein than sedentary individuals
- Individuals involved in strenuous exercise may benefit from additional protein intake

‡ A complete list of approved claims is posted on mannatechscience.org.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

MULTIPLE PRODUCTS
OPEN-LABEL TRIAL



Sinnott RA, Maddela RL, Bae S, Best T. (2013) The effect of dietary supplements on the quality of life of retired professional football players. *Global J Health Sci* 2(5):13-26.

Mannatech scientists, an independent statistician and Dr. Talitha Best of the University of South Australia conducted a six-month open label trial of 15 retired football players. Intake of selected Mannatech products resulted in significant improvements in numerous self-reported measures of physical and mental health, quality of life, memory, and elbow and knee pain reduction. Study participants took Ambrotose complex powder, Omega 3 with vitamin D3 capsules, Ambrotose AO capsules, PhytoMatrix caplets and PLUS caplets.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4776780/>