



## Shaklee Clinical Studies

### Shaklee Clinical Research Studies

Shaklee's commitment to clinical research is reflected in every product it makes. The ideal balance of nature and science is not achieved by guesswork. It is a meticulous process of research and development, testing, and refinement. That's why Shaklee continues to invest in clinical research as part of its ongoing commitment to scientific integrity. The following peer-reviewed clinical studies sponsored by Shaklee scientifically substantiate either Shaklee products or the testing of concepts leading to Shaklee products.

The list below consists of two parts. Section A identifies studies performed on ingredients in Shaklee's current products, while the second lists studies pertaining to earlier versions of Shaklee products.

#### A. Current Product Clinical Studies

##### ATHLETES - GENERAL

Nutrient Intake of Elite Male and Female Nordic Skiers. Ellsworth, Hewitt, Haskell. Physician Sports Med 1985; 13: 78-92.

The Coach and Nutritionist - A Partnership in Performance. A Case Study - Applied Nutrition with the US Ski Team and Mount Everest Expedition. Shrimpton, Ottaway, eds. In: Nutrition in Sport: Proceedings of a National Symposium held at the Institute of Directors, London 1985: 76-83.

Transitory Hematologic Effects of Moderate Exercise are not Influenced by Iron Supplementation. Hegenauer, Strause, Saltman, Dann, White, Green. Eur J Appl Physiol 1983;52:57-61.

Dietary Intakes of Male Endurance Cyclists During Training and Racing. Jensen, Zaltas, Whittam. J Am Diet Assoc. 1992;92:986-8.

##### VITAMIN B-COMPLEX

Enhancement of Folic Acid Dissolution in Solid Dosage Forms of Dietary Supplements. DeBernardi, Subramanian, Hegenauer. American Chemical Society, Division of Agricultural & Food Chemistry, Spring 2002 (poster/abstract).

##### CARBO-CRUNCH® & SHAKLEE PERFORMANCE®

Carbohydrate Supplementation Spares Muscle Glycogen During Variable-Intensity Exercise. Yaspelkis, Patterson, Anderla, Ding, Ivy. J Appl Physiol 1993;75:1477-85.

##### SHAKLEE PERFORMANCE®

The Physiology of Human-Powered Flight. Weiss. Science News 1990;137:140.

The Effects of Sodium: Carbohydrate (Na: Carb) Ratios in Rehydration beverages (RB) on Plasma (PG), Osmolality (PO), Volume (PV), and Subject Tolerance (ST). FASEB J 1990;4:A381 (abstract).



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The Daedalus Project: Physiological Problems and Solutions. Nadel, Bussolari. Am Scientist 1988;76:351-60.

Glucose-Electrolyte Ingestion: Influence on Endurance Factors in Highly Trained Female Cyclists. Sirotniak, Foster. Med Sci Sports Exer Suppl 1992;24:S121 (abstract).

Vascular Uptake of Rehydration Fluids in Hypohydrated Men at Rest and Exercise. Greenleaf, Geelen, Jackson et al. NASA Technical Memorandum 1992:1039-42.

Vascular Uptake of Rehydration Fluids in Resting Hypohydrated Men. Greenleaf, Geelen, Saumet et al. FASEB J 1991;5:A1147 (abstract).

Hypervolemia in Men from Drinking Hyperhydration Fluids at Rest and During Exercise. Greenleaf, Looft-Wilson, Wisherd et al. NASA Technical Memorandum 1994:46-57.

Drink Composition and Cycle-Ergometer Endurance in Men: Carbohydrate, Na<sup>+</sup>, Osmolality. Greenleaf, Looft-Wilson, Wisherd et al. NASA Technical Memorandum 1994:46-50.

CD4<sup>+</sup>/CD8<sup>+</sup> T-Lymphocyte Ratio: Effects of Rehydration Before Exercise in Dehydrated Men. Greenleaf, Jackson, Lawless. Med Sci Sports Exer 1995;27:194-9.

Drinking-Induced Plasma Vasopressin and Norepinephrine Changes in Dehydrated Humans. Geelen, Greenleaf, Keil. J Clin Endocrinol Metab 1996;81:2131-35.

Hypervolemia in Men from Fluid Ingestion at Rest and During Exercise. Greenleaf, Looft-Wilson, Wisherd et al. Aviat Space Environ Med 1998;69:374-86.

## PHYSIQUE®

Carbohydrate-Protein Complex Increases the Rate of Muscle Glycogen Storage after Exercise. Zawadzki, Yaspelkis, Ivy. J Appl Physiol 1992;72:1854-9.

Dietary Supplements Affect the Anabolic Hormones after Weight Training Exercise. Chandler, Byrne, Patterson, Ivy. J Appl Physiol 1994;76:839-45.

Pre-Exercise Hypervolemia and Cycle Ergometer Endurance in Men. Greenleaf, Looft-Wilson, Wisherd, McKenzie, Jensen, Whittam. Biology of Sport 1997;14:103-14.

## BETA CAROTENE

Comparison of Serum Carotene Repletion with Two Levels of Carrots and an Algae-Derived Product in Healthy Adult Humans. Pattison, Spiller, Jensen, Whittam, Scala, Fed Proc 1985; 44:771 (abstract).

Repletion and Depletion of Serum Alpha and Beta Carotene in Humans with Carrots and an Algae-Derived Supplement. Jensen, Pattison, Spiller, Whittam, Scala. Acta Vitaminol Enzymol 1985;7:189-98.

Observations on the Effects in Humans of Cis- and Trans-beta Carotene Isomers. Jensen, Howes, Spiller, Scala. Am J Clin Nutr 1986;43:689 (abstract).



## Shaklee Clinical Studies

Acute Effects of Dietary Carotenes on Serum Alpha and Beta Carotene in Humans. Jensen, Spiller, Pattison, Whittam, Scala. Nutr Rep Int 1986;33:117-22.

Observations on the Effects of Ingesting Cis- and Trans-Beta-Carotene Isomers on Human Serum Concentrations. Jensen, Howes, Spiller, Pattison, Whittam, Scala. Nutr Rep Int 1987;35:413-22.

Effect of Graded Levels of Beta-Carotene on Skin Yellowing in Healthy Humans. Spiller, Jensen, Dronkert, Whittam. FASEB J 1989;3:A465 (abstract).

### **CALCIUM**

Effects of High Calcium Intake on Magnesium Excretion. Spiller, Jensen, Whittam. FASEB J 1988;2:A1099 (abstract).

Effect of Nutrient Intervention on Bone Mineral Density and Biomarkers of Bone Remodeling. Jensen, Block. Am J Epidemiol 1999;149 (S11);S30:A119 (abstract).

### **COSMETICS & TOILETRIES**

Salon Testing: Art or Science? Whittam. Cosmetics & Toiletries 1988;103:43-6.

Use of the MatTek EPI-100 in vitro System to Screen Antioxidant Efficacy. Rachui, Duke, Allen. J Toxicol Cut Ocular Toxicol 1995;14:237-50.

Clinical Testing of Personal Care Products. Roberts, Greene. The Chemist 1999:23-26.

### **DENTIFRICE**

Clinical Study of the Effect of an Organic Dentifrice on Gingivitis and Plaque Formation. Soparkar, Newman, Depaola, Poovaiah. J Dental Res 1980;59:276 (abstract).

Clinical Study of the Effectiveness of an Organic Dentifrice for Stain Removal. Newman, Soparkar, Depaola, Poovaiah. J Dental Res 1980;59:276 (abstract)

### **OMEGA-3 FATTY ACIDS**

Marine Lipids and Atherosclerosis: A Review. Davidson, Liebson, Cardiovascular Reviews & Reports. Vol 7, No. 5, May 1986.

Effect of Low Dose Omega-3 Fatty Acids on Plasma Fatty Acids and Lipids. Spiller, Jensen, Scala. Am J Clin Nutr 1987;45:857 (abstract).

Plasma Lipids on Three Levels of Fish Oil Intake in Healthy Human Subjects. Jensen, Spiller, Wookey, Wong, Whittam, Scala. Nutr Rep Int 1988;38:165-72.

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### FIBER

Correlation of Gastrointestinal Transit Time to Fecal Weight in Adult Humans at Two Levels of Fiber Intake. Spiller, Wong, Whittam, Scala. *Nutr Rep Int* 1982;25:23-30.

Modification of Human Fecal Steroid Excretion by a Dietary Fiber Supplement. Story, Petro, Spiller, Wong, Whittam, Scala. *Fed Proc.* 1983;42:A4512 (abstract).

Effect of Four Levels of Hard Wheat Bran on Fecal Composition and Transit Time in Healthy Young Women. Spiller, Wong, Nunes, et al. *Fed Proc* 1984;43:392 (abstract).

Modification of Fecal Steroid Excretion in Humans by Hard Red Wheat Bran. Story, Petro, Furumoto, Scala, Spiller. XIII International Congress of Nutrition, Brighton, UK 1985 (abstract).

Subjective Evaluation of Satiety After Fiber Consumption. Wookey, Jensen, Moshrefi, Spiller. *Fed Proc* 1986;45:A2575 (abstract).

Effect of Increasing Levels of Hard Wheat Fiber on Fecal Weight, Minerals, Steroids and Gastrointestinal Transit Time in Healthy Young Women. Spiller, Story, Wong et al. *J Nutr* 1986;116:778-85.

Effects of Solid and Liquid Guar Gum on Plasma Cholesterol and Triglyceride and Triglyceride Concentrations in Moderate Hypercholesterolemia. Superko, Haskell, Sawrey-Kubicek, Farquhar. *Am J Cardiol* 1988;62:51-5.

The Effect of Three Doses of a Water Soluble Dietary Fiber (WSDF) Mixture on Plasma Cholesterol in Humans. Spiller, Jensen, Gates, Nichols, Whittam. International Symposium on Multiple Risk Factors in Cardiovascular Disease, Washington DC 1990 (abstract).

Plasma Cholesterol-Lowering Efficacy of a Mixture of Water Soluble Dietary Fibers (WSDF) Compared to Guar Gum. International Symposium on Multiple Risk Factors in Cardiovascular Disease, Washington DC 1990 (abstract).

The Relationship of Water Soluble Dietary Fiber (WSDF) Structure to Plasma Cholesterol-Lowering Efficacy in Humans. Spiller, Jensen, Gates, Nichols, Whittam. International Symposium on Multiple Risk Factors in Cardiovascular Disease, Washington DC 1990 (abstract).

Role of Water-Soluble Dietary Fiber in the Management of Elevated Plasma Cholesterol in Healthy Subjects. Haskell, Spiller, Jensen, Ellis, Gates. *Am J Cardiol* 1992;69:433-9.

The Effect of Acacia Gum Versus a Mixture of Water-Soluble Dietary Fibers on Blood Lipids in Humans. Jensen, Spiller, Gates, Miller, Whittam. *FASEB J* 1992;6:A1654 (abstract).

The Effect of Acacia Gum Versus a Mixture of Water-Soluble Dietary Fibers on Blood Lipids in Humans. Jensen, Spiller, Gates, Miller, Whittam. *J Am Coll Nutr* 1993;12:147-54.

Long-term Effects of Water-Soluble Dietary Fiber in the Management of Hypercholesterolemia in Healthy Men and Women. Jensen, Haskell, Whittam. *Am J Cardiol* 1997;79:34-37.



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### HERBS

An Herbal Approach to Ease the Transition to Menopause. Manning. Nutr in Complementary Care (newsletter) Winter 2000;2(2):3.

Herbs in the Prevention and Treatment of Cardiovascular Diseases. Westerdahl. Nutrition in Complementary Care (newsletter) Winter 2000;2 (20):16-19.

### INSTANT PROTEIN® SOY MIX

Effects of a High-Protein Supplement on Body Weight and Blood Constituents of Overweight and Obese Individuals. Albanese, Wein, Carroll. Nutr Rep Int 1984;29:193-204.

Biological and Biochemical Evaluation of Commercial Powdered Protein Products. Jenkins, Mitchell. Nutrition Reports Intl. Sept 1981. Vol 24. No. 3.

### MEAL SHAKES

Effect of Low-Calorie Diets on Retinol-Binding Protein (RBP) Status in Women. Wookey, Sacks, Jensen, Scala, Spiller. Am Diabetes Assoc 47th Scientific Sessions Meeting, Indianapolis, 1987 (abstract).

### MULTIVITAMIN - MINERAL SUPPLEMENTATION

Effects of Calcium and Micronutrients on Premenopausal and Postmenopausal Bone Loss. J Am Med Assoc 1980;244:1915 (abstract).

Effects of Vitamin/Mineral Intervention on Increasing Bone Density of Postmenopausal Women. 4th European Nutrition Conference. The Hague, Netherlands 1983 (abstract).

Some Effects of Vitamin and Mineral Supplementation in Healthy Young Women. Spiller, Pattison, Jensen, Wong, Whittam, Scala. Fed Proc 1985;44:1283 (abstract).

Multivitamin-mineral Supplementation: Effects on Blood Chemistries of College-Age Women. Spiller, Pattison, Jensen, Wong, Whittam, Scala. Acta Vitaminol Enzymol 1985;7:217-22.

Calcium Nutrition and Skeletal and Alveolar Bone Health. Albanese, Lorenze, Edelson . Nutr Rep Int 1985;31:741-55.

Training for Cross-Country Skiing and Iron Status. Haymes, Puhl, Temples. Med Sci Sports Med 1986;18:162-7.

Dietary Supplements. Jensen, Briggs. J Am Med Assoc 1987;258:908-10.

Effect of Age and Fractures on Bone Loss and Calcium Needs of Women 45 to 85+ years of Age. Albanese, Edelson, Lorenze, Wein, Carroll. Nutr Rep Int 1985;31:1093-115.

Homocysteine Lowering in Men and Women with Normal Plasma Homocysteine Levels. Spiller, Bruce, Jensen. J Am Coll Nutr 1998;17:530 (abstract).



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Effect of Long-Term Vitamin-Mineral Supplements on Immune Response in Older Healthy Adults. Spiller, Whittam, Bruce, Morse, Chernoff, Jensen. J Am Coll Nutr 1998;17:511 (abstract).

Improvement in Folate Indices in Blood and Seminal Plasma Following Vitamin Supplementation in Smokers and Nonsmokers. Wallock, Tamura, Ames, Johnston, Gretz, Jacob. Experimental Biology 1999:671.10 (abstract).

### CHROMIUM

Chromium and Exercise Training: Effect on Obese Women. Grant, Chandler, Castle. Med Sci Sports Exerc 1997;29:992-8.

### SELENIUM

Cytotoxic Activity of Selenium Compounds and Glutathione Peroxidase Assessed by Scanning Electron Microscopy. Spallholz, Feitas, Hu, Whittam. Fed Proc 1982;41:529 (abstract).

Selenium Intake and Metabolic Balance in 10 men Consuming Self-Selected Diets in a Selenium-Deficient Area of Hebei Province, People's Republic of China. Luo, Yang, Wei et al. Fed Proc 1984;43:473 (abstract).

Effect of Selenium Supplements on the Selenium Levels and Glutathione Peroxidase Activity of Residents in a Selenium-Deficient Area of Hebei Province, People's Republic of China. Wei, Luo, Yang et al. Fed Proc 1984;43:473 (abstract).

Selenium Intake and Metabolic Balance of 10 Men from a Low Selenium area of China. Luo, Wei, Yang., et al. Am J Clin Nutr 1985;42:31-7.

Bioavailability of Selenium to Residents in a Low-Selenium Area of China. Luo, Wei, Yang. Am J Clin Nutr 1985;42:439-48.

### SHAMPOO

Evaluation of Relative Shampoo Detergency. Thompson, Lemaster, Allen, Whittam. J Soc Cosmet Chem 1985;36:271-86.

### SOY

Effects of Supplemental Soy Protein in Hypercholesterolemic Postmenopausal Women. Bruce, Spiller, Jensen, Haskell, Gardner. Cardiovascular Health: A National Conference, San Francisco 1998 (abstract).

The Effect of Soy Protein With or Without Isoflavones Relative to Milk Protein on Plasma Lipids in Hypercholesterolemic Postmenopausal Women. Gardner, Newell, Cherin, Haskell. Am J Clin Nutr 2001;73:728-35.



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### VITAMIN C

The Kinetics of Vitamin C in Human Blood Plasma from Vitamin C Supplements. Poovaiah, Rider, Scala. Fed Proc 1980;39:557 (abstract).

Automated Testing of Slowly Changing Levels of Analytes in Mixtures, Pattison, Allen, Ashley. Clinical Chemistry, Vol 28, No. 7. 1982.

### VITAMIN E

Alfalfa, Vitamin E and Autoimmune Disorders. Whittam, Jensen, Hudson. Am J Clin Nutr 1995;62:1025-6.

## B. Clinical Studies Performed on Ingredients in Shaklee's Former Products

### SHAKLEE FITNESS®

Response of Serum Glucose and Insulin to Meals of Various Compositions Fed after Exercise. Butterfield, Borchers. Sports Med Training Rehab 1993;4:304 (abstract).

Effects of Diet and Exercise on Weight Loss, Fat Distribution and Blood Lipid Changes in Moderately Obese Older Women. Fox, Thompson, Moynihan, Gylfadottir, Butterfield. Med Sci Sports Exer 1994;26:S58 (abstract).

The Effect of Diet and Exercise on Basal Metabolic Rate in Older Women. Thompson, Moynihan, Gylfadottir, Vizioli, Butterfield. Med Sci Sports Exer 1994;26:S79 (abstract).

Effects of Diet and Exercise on Common Cardiovascular Disease Risk Factors in Moderately Obese Women. Fox, Thompson, Butterfield et al. Am J Clin Nutr 1996;63:225-33.

Effects of Diet and Exercise on Energy Expenditure in Postmenopausal Women. Thompson, Gylfadottir, Moynihan, Jensen. Am J Clin Nutr 1997 Oct, 66:867-873.

### FRUIT BARS

Postprandial Glycemia on Two Sweet Confections with Different Carbohydrate Patterns. Chuck, Scala, Spiller, Whittam. Fed Proc 1982;41:398 (abstract)

### SLIM PLAN

Safety, Effectiveness and Tolerance of 800 and 1000 Calorie Diets Incorporating Two Packages of Meal-Shake Daily. Sacks, Blankenbaker, Minear. Shaklee Corporation, 1983.



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Weight Loss on a Combined Regimen of Formula Diet and Traditional Food. Whittam, Chuck, Ikemiya. Whittam, Chuck, Ikemiya et al. 4th International Conference on Obesity, New York City 1983 (abstract).

Weight Management Program Designed for and Administered by Non-Professional Leaders. Whittam, Scala, Sacks, 39. Saltman, Altshul. 4th European Nutrition Conference, The Hague, Netherlands 1983 (abstract).

630 Kcal Formula Diet Versus 1,200 Kcal Balanced Deficit Diet: Comparison of Weight Loss and Safety. Minear, Blankenbaker, Sacks. AM Diet Assoc Annual Meeting 1983 (abstract).

Compulsive Eating, Depression and Failure to Complete a Behavioral Group Weight Loss Program. Hoage, Fediuk. 4th International Congress on Obesity, New York City 1983 (abstract).

Postprandial Hyperglycemia in a Complete Liquid Formula Diet, its Carbohydrate Fraction and Glucose. Spiller, Ashley, Whittam, Scala. International Congress of Diabetes and Nutrition, Crete, Greece 1983 (abstract).

Safety and Effect on Weight, Hemoglobin A-1C, Serum Glucose and Blood Pressure of a Liquid Formula Diet Combined with Traditional Food in Adult Diabetic Patients: A Pilot Study. Dronkert, Spiller, Whittam, Scala. Diabetes and Hypertension Meeting, Bern, Switzerland 1984 (abstract).

Effect on Postprandial Glycemia of a Formula Diet and its Carbohydrate Fraction With or Without Protein and Fat. Spiller, Ashley, Chuck, Pattison, Whittam, Scala. Am J Clin Nutr 1984;39:671 (abstract).

Effect on Protein Quantity and Quality on the Serum Glucose Response to the Sugars of a Formula Diet. Spiller, Pattison, Jensen, Whittam, Scala. Am J Clin Nutr 1985;41:854 (abstract).

The Effects of Aerobic Conditioning and/or Caloric Restriction in Overweight Men and Women. Hagan, Upton, Wong, Whittam. Med Sci Sports Exer 1986;18:87-94.

Effect of Protein Dose on Serum Glucose and Insulin Response to Sugars. Spiller, Jensen, Pattison, Chuck, Whittam, Scala. Am J Clin Nutr 1987;46:474-80.

Hypocholesterolemic Effect of Vegetable Protein in a Hypocaloric Diet. Jenkins, Wolever, Spiller et al. Atherosclerosis 1989;78:99-107.