

**How Enhanced Whey
Protein Concentrate
(EWPC) Reduces the
Length of the Telogen
(Dormancy) Phase After
a Hair Transplant**



Dr. Larry J. Shapiro, D.O.P.A.

- Offices in Delray Beach, FL and Hollywood, FL
- In practice since 1989
- Performed over 11,000 hair transplant procedures
- Background: Dermatology
www.DrShapirosHairInstitute.com
- Conflict of Interest: Owner,
Inventor with Patent Pending



History of Research

Connection between Hair Loss and Lifestyle Products especially anabolics testosterone and DHT

Includes:

- Steroids
- Creatine (increases DHT directly)¹
- Growth Hormone²
- Andro or similar products³
- Whey Protein Isolate⁴
- Weight gainers¹
- Fat burners/fad diets (not directly affecting DHT)

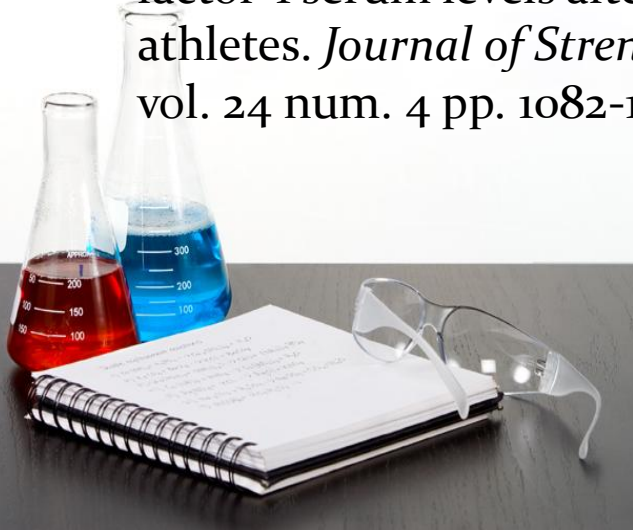


1. "Three weeks of creatine monohydrate supplementation affects dihydrotestosterone to testosterone ratio in college-aged rugby players." by van der Merwe J, Brooks NE, Myburgh KH. Department of Physiological Sciences, Stellenbosch University, Stellenbosch, South Africa. *Clin J Sport Med.* 2009 Sep;19(5):399-404.
- 2 "Synergistic effects of testosterone and growth hormone on protein metabolism and body composition in prepubertal boys." by Mauras N, Rini A, Welch S, Sager B, Murphy SP. Nemours Children's Clinic Division of Endocrinology and Nemours Research Program, Jacksonville, FL 32207, USA. *Metabolism.* 2003 Aug;52(8):964-9.
- 3 "17beta-hydroxy-5alpha-androst-1-en-3-one (1-testosterone) is a potent androgen with anabolic properties." Friedel, et al. *Toxicol Lett*, Aug 2006; 165(2): 149-55.
- 4 Hulmi JJ, Ahtiainen JP, Selänne H, Volek JS, Häkkinen K, Kovanen V, Mero AA. Androgen receptors and testosterone in men - Effects of protein ingestion, resistance exercise and fiber type. *J Steroid Biochem Mol Biol.* 2008 Mar 30. [Epub ahead of print]

Determine Reason for WPI Causing Hair Loss

Two studies show WPI affected testosterone:

- Hulmi JJ, Ahtiainen JP, Selänne H, Volek JS, Häkkinen K, Kovanen V, Mero AA. Androgen receptors and testosterone in men - Effects of protein ingestion, resistance exercise and fiber type. *J Steroid Biochem Mol Biol.* 2008 Mar 30. [Epub ahead of print]
- Zajac A, Poprzecki S, Zebrowska A, Chalimoniuk M, Langfort J. Arginine and ornithine supplementation increases growth hormone and insulin-like growth factor-1 serum levels after heavy-resistance exercise in strength-trained athletes. *Journal of Strength and Conditioning Research* 2010 April vol. 24 num. 4 pp. 1082-1090



Goal

- Develop a product for working out without causing hair loss



Studied Whey Protein Production

Whey Protein Concentrate is the most common and least processed

Step 1. Milk - Dairy herds that have be raised without the use of antibiotics, steroids or growth hormones



Milk is collected daily, refrigerated and taken to the dairy plant to be pasteurized. The milk at this stage can either be sold either as full fat milk or used to make cheese which is what we are interested in.

Studied Whey Protein Production

Step 2 – Cheese and Sweet Dairy Whey

After the milk has been pasteurized, a bacteriological starter is added to 'sour' and thicken the milk. A renneting agent is added to the milk to form curds. The curd is left to set.

The curds are cut so that the whey is released. The curds are either 'cooked' or are piled on top of each other, and further cut to expel whey.



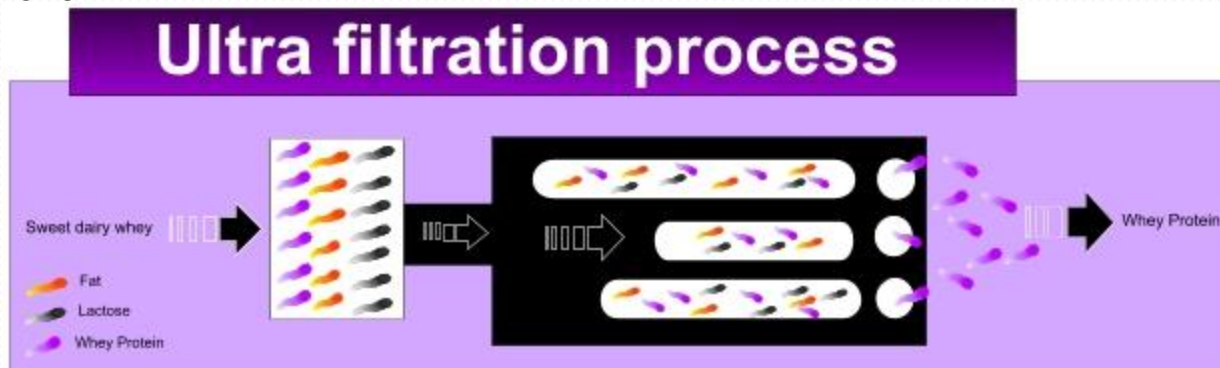
Studied Whey Protein Production

Step 3 – Ultra Filtration of Sweet Dairy Whey

Sweet dairy whey is passed through vast numbers of ultra filtration units at room temperature. As the "whey" passes through the filters fat and lactose are removed to leave a concentrated whey protein in liquid suspension. The liquid concentrate is then dried and instantised for easy mixing. The whole process is carried out without the use of excess heat which helps prevent any damage occurring to the product.

Whey Protein Concentrate is then further processed to Whey Protein Isolate by microfiltration and ultrafiltration, and ion exchange. Fat and lactose are removed but with ion exchange because of the reagents can damage and denature the protein.

- Glycomacropeptides GMPs
- immunoglobulins- antibodies
- lactoferrin- antiviral anti cancer and immune modulation
- alpha lactalbumin
- With CFM Cross Flow Microfiltration(microfiltration and ultrafiltration)less denatured but CFM Whey isolate yields a higher amount of BCAA leading to increased amounts of testosterone



Studied Growth Hormone-Free Enhanced Whey Protein Concentrate (EWPC) (34%)

Whey Protein Concentrate (WPC):

1. Lower Percentage of Branched Chain Amino Acids - less androgenic
2. Less denatured - higher glutathione levels - lower levels possible link to MPB
3. Enhanced the WPC with a variety of amino acids, vitamins and minerals
4. Superior protein qualities – High BV, digestible, bioactive ingredients, less protein than WPI, metabolism

Studied Growth Hormone-Free Enhanced Whey Protein Concentrate (EWPC) (34%)

References

1. Lower Percentage of Branched Chain Amino Acids - less androgenic

BCAAs include leucine, isoleucine, and valine are of special importance for athletes because they are metabolized in the muscle, rather than in the liver

Zajac A, Poprzecki S, Zebrowska A, Chalimoniuk M, Langfort J. Arginine and ornithine supplementation increases growth hormone and insulin-like growth factor-1 serum levels after heavy-resistance exercise in strength-trained athletes. *Journal of Strength and Conditioning Research* 2010 April vol. 24 num. 4 pp. 1082-1090

Studied Growth Hormone-Free Enhanced Whey Protein Concentrate (EWPC) (34%)

References

3. Enhanced the WPC with a variety of amino acids, vitamins and minerals

- Vitamins for your Hair. Dr. George Obikoya <http://www.vitamins-nutrition.org/vitamins/vitamins-hair.html>
- Biotin and Hair Loss -- The Wonder Vitamin For Your Hair? Corbin Newlyn <http://www.articlesbase.com/hair-loss-articles/biotin-and-hair-loss-the-wonder-vitamin-for-your-hair-410391.html>
- The Clinical Effects of Manganese (Mn) by E. Blaurock-Busch, PhD - <http://www.tldp.com/issue/180/Clinical%20Effects%20of%20Mn.html>
- Fo-ti Root (Polygonum multiflorum) HerbWisdom.com - <http://www.herbwisdom.com/herb-fo-ti-root.html>
- Acupuncture and Electro-Therapeutics Research International Journal, Vol. 6, 1981, pp19-31.
- Kudzo - Memorial Sloan-Kettering Cancer Center <http://www.mskcc.org/mskcc/html/69276.cfm>
- <http://www.hairlosssupplements.com/hair-care-herbal-supplements/kudzu-herbal-supplement.shtml>
- "Pumpkin Seed Oil is good for your health," Vitamet <http://vitametonline.com/forums/1/Thread/1102>
- Treatment: Pumpkin Seeds The Analyst <http://www.diagnose-me.com/treat/T209693.html>
- Pumpkin seeds and herbal remedies" <http://www.hairlosssupplements.com/hair-care-herbal-supplements/herbal-supplements-pumpkin-seeds.shtml>
- Honeysuckle extract! Blog post on Point of Interest! by Susan Barclay 2/12/2010 <http://swiftcraftymonkey.blogspot.com/2010/02/honeysuckle-extract.html>
- Chrysanthemum - Memorial Sloan-Kettering Cancer Center <http://www.mskcc.org/mskcc/html/69184.cfm>
- "Anti-inflammatory activity of Chrysanthemum indicum extract in acute and chronic cutaneous inflammation" by Do Yeon Leea, Goya Choia, Taesook Yoona, Myeong Sook Cheona, Byung Kil Chooa and Ho Kyoung Kim, Journal of Ethnopharmacology Volume 123, Issue 1, 4 May 2009, Pages 149-154 http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T8D-4VM4411-3&_user=10&_coverDate=05%2F04%2F2009&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=83b9ccda654c55bc2b041b9b0dee1f63
- PABA (Para-Amino benzoic Acid): Nutritional Co-Factor and Antioxidant by Vitamin Research Products <http://www.vrp.com/articles.aspx?ProdID=607>
- The Scientific Secret to Healthy Shiny Hair and Nails Revealed! http://www.smart-publications.com/overall_health/hair_and_nails.php

Studied Enhanced Whey Protein Concentrate

4. Superior Protein qualities

- a) Whey protein contains bioactive ingredients, like immunoglobulins and lactoferrin, that help support the immune system unlike soy or pea protein
- b) Easily digestible
- c) Pleasant tasting / Affordable / Available
- d) BV - High Biological Value – see table
- e) WPC (34%) has less percentage of total protein than WPI (80-100%)
- f) Whey Protein metabolized by the liver at 10gm/hr except WPI with BCAAs metabolized by the muscle
- g) Whey protein easily absorbed – small molecular weight
- h) Possible better absorption of the added vitamins?

Protein Supplement	Protein Rating
Whey Protein Isolate	159
Whey Protein Concentrate	104
Casein	77
Soy	68
Pea Protein	57

Typical Hair Transplant Regrowth Rate



Control - Hair transplant without EWPC shows little significant growth after 3 months

Unexpected Side Effect

After patients tried EWPC, hair transplant regrew in faster



Clinical study patient 12 – before hair transplant



Clinical study patient 12 – 3 months after hair transplant and EWPC

Unexpected Side Effect

After patients tried EWPC, hair transplant regrew in faster



Clinical study patient 5 - before hair transplant



Clinical study patient 5 - 4 months after hair transplant and EWPC

Unexpected Side Effect

After patients tried EWPC, hair transplant regrew in faster



Clinical study patient 32
before hair transplant



Clinical study patient 32
directly after hair transplant



Clinical study patient 32 – 6 months
after hair transplant and EWPC

Study Using EWPC - Protocols

1. All patients used 2 scoops a day for 3 months after hair transplant
2. Protocols
 - a) No anabolic products or fat burners allowed
 - b) All patients screened for thyroid, anemia, iron deficiency
 - c) All patients use finasteride 1 mg daily
 - d) Minoxidil 2% 2x daily
 - e) Followed our preop sheet



Study Using EWPC - Protocols

3. Subjects were instructed to take EWPC immediately following their hair transplant each day for at least 3 months.
4. Of the 115 subjects in the study group, 85 had their first hair transplant, and 30 had their second ("second sitting") or subsequent hair transplant
5. Additionally, these subjects were also not taking any lifestyle products that might adversely affect their hair, such as Whey Protein Isolate (WPI), using testosterone patches, or ingesting or injecting growth hormones, fat burners , fad diets, soy products, creatine, or anabolics.
6. All subjects screened for allergies to Iodine, PABA, taking sulfonamides, pregnant, lactating or have liver disease, drink excessive alcohol, smoke, uncontrolled diabetics, lactose intolerance.
7. Not using any other hair vitamins especially those with biotin because we do not want them to exceed 5 mg biotin/day

Study Using EWPC - Protocols

- All subjects were given our normal preoperative sheet of avoiding aspirin, alcohol, spicy foods, vitamins so as to avoid bleeding and to do a 2 week vigorous massage on the top and back of their head with a connair massager for maximum elasticity and blood flow.
- All subjects were treated with slit incisions with blades at various sizes.
- At no time was a 16 gauge needle or punch utilized.



Study Using EWPC - Controls

- Controls: 105 patients
 - a) No anabolic products or fat burners allowed
 - b) All patients screened for thyroid, anemia, iron deficiency
 - c) All patients use finasteride 1 mg daily
 - d) Minoxidil 2% 2x daily
 - e) Followed our preop sheet



Study Using EWPC - Demographics

1. 115 subjects in the study group
 1. 85 first hair transplant
 2. 30 second ("second sitting") or subsequent hair transplant
2. Adults aged 20 to 72
3. 21% women - 79% men
4. Selected at random from a group of patients seeking hair transplants.
5. Not compensated - given a supply of EWPC
6. Healthy with no serious underlying medical conditions
7. No thyroid problems
8. No iron deficiency
9. No anemia

Results

6 Weeks

Subjects	Controls
115 of the subjects (100%) had 1-2 hairs starting to grow in the transplanted area	No growth showing at 6 weeks

12 Weeks

Subjects	Controls
All the EWPC subjects (100%) had significant growth of at least 3/4"	No significant growth

Follow-up Study – Subset of 52 Patients

- same protocol but study group used EWPC for 9 months
- measured at 6 months and 9 months after transplant
 - 5 patients (10%) had complete growth by 5 months
 - 41 patients (79%+10%) had complete growth by 6 months
 - 6 patients (11%) had complete growth by 7 months
- control group: 48 patients
 - 0 (0%) had complete growth at 6 months
 - 32 patients (67%) had 50% growth at 6 months
 - 16 patients (33%) had 40% or less growth at 6 months
 - At 9 months, all controls had complete growth

In Practice

- **Currently 350 patients on EWPC**



Before / After



Clinical study patient 2 - before hair transplant



Clinical study patient 2 – 6 months after hair transplant and EWPC

Before / After



Clinical study patient 10 - before hair transplant



Clinical study patient 10 – 6 months after hair transplant and EWPC

Before / After



Clinical study patient 19 - before hair transplant

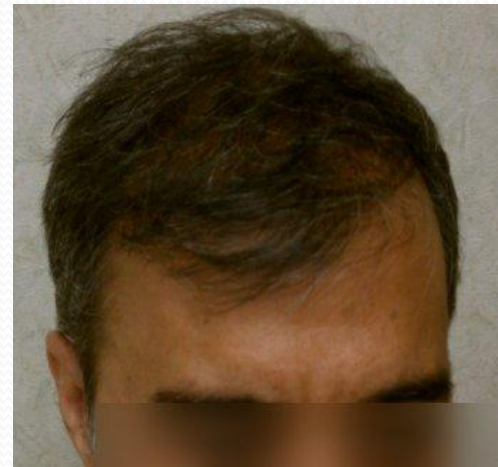


Clinical study patient 19 – 6 months after hair transplant and EWPC

Before / After



Clinical study patient 17 - before hair transplant



Clinical study patient 17 – 6 months after hair transplant and EWPC

Enhanced Whey Protein Concentrate (EWPC)

Clearly, nutritional supplementation can have a strong positive impact on the speed of results after a hair transplant and reduce the length of the telogen phase

