



Make Your Liver Happy!

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In this month's eNewsletter I want to introduce you to Max Muscle Sports Nutrition (MMSN) newest product innovation, L-Tox, for advanced liver support. L-Tox was formulated to help stimulate maximum liver detoxification along with protective and regenerative factors. L-Tox contains specific and highly concentrated herbs and nutraceuticals to modulate the two main detoxification enzyme systems in the liver, known as the Phase I and Phase II detoxification systems. L-Tox also contains important liver antioxidants and nutrients to nourish the liver for optimal function and health.*

Liver Facts

The liver is the largest internal organ in the body and comprises about 2% (about 3 lbs) of the total body weight. Most of us do not give much thought to the importance of the liver, but it is one of the hardest working organs in the body and plays a major role in metabolism performing more than 500 different functions and thousands of chemical reactions per day. As a 24 hour chemical plant, the liver is involved in the synthesis of hundreds of enzymes in the body necessary for metabolic reactions, the synthesis, processing and storing of nutrients (proteins, carbohydrates, fats, vitamins and minerals), producing immune factors, hormonal balance and hundreds of other metabolic reactions. Most important, the liver is the main organ that filters the blood (about 2 quarts every minute) and metabolizes and eliminates toxins from the body. Examples would include bacterial endotoxins, drugs, alcohol, cigarette smoke, environmental toxins (pollutants,

pesticides, contaminants) and other harmful chemicals. The body then eliminates these metabolic end-products through the urine and feces/stools.

The Science of Liver Detoxification

The liver has two major detoxification pathways named the Phase I and Phase II detoxification systems. The Phase I detoxification system is composed mainly of cytochrome P450 (CYP450) supergene family of enzymes and is generally the first line of enzymatic defense against foreign compounds to inactivate them. The Phase II detoxification system, called the conjugation pathway, takes over following the Phase I system and functions to transform compounds into water-soluble compounds to be excreted by the body. If these two pathways are not supportive and working optimally, reactive toxins will cause damage to proteins, DNA, RNA and other important cell organelles.

The L-Tox Formulation and Function

L-Tox contains specific herbs and nutrients that supports both Phase I and Phase II detoxification systems for optimal function and health. Here is how these nutrients work:

Supports Phase I (CYP450 Enzymes) detoxification system: Vitamin C, Thiamin, Vitamin B6, Folic Acid, Vitamin B12, Pantothenic Acid, Green Tea Extract (standardized to contain 45% EGCG), Phosphatidylcholine (PC) and Magnesium. Phosphatidylcholine is the most abundant phospholipid in the body and concentrated in the liver, brain and nervous system. Phosphatidylcholine is absolutely essential for the normal and healthy structure and function of the liver in the detoxification of drugs, alcohol and other waste materials.

Supports Phase II (Conjugation Pathways) detoxification system:

One of the cornerstone molecules in the Phase II detoxification system is glutathione. Glutathione is an important and powerful intracellular (within the cells) antioxidant so it's critical that levels are optimized. N-Acetyl-L-Cysteine (NAC) along with Glycine and Methionine help to stimulate glutathione synthesis within the liver. Cysteine, Glycine, and Glutamine all work synergistically with NAC to support liver glutathione levels along with Alpha Lipoic Acid (ALA) and Vitamin C. Additionally, silymarin is the bioactive flavonoid found in the Milk Thistle Extract. Silymarin prevents the depletion of glutathione and has been shown to increase liver glutathione levels up to 35%. We use the highest standardization of silymarin available at 80% for maximum potency. The Artichoke Leaf Extract is also a member of the milk thistle family and we use a standardized extract to contain a minimum of 5% cynarin. The Artichoke Extract further supports liver detoxification and aids in the digestive process by promoting healthy bile flow and intestinal motility, reducing toxin exposure in the intestine. BroccoPlus* is a highly concentrated Broccoli Sprout Extract, standardized to contain 3,000 ppm sulforaphane and 6% glucosinolates. BroccoPlus* has been shown in clinical studies to boost the activity of Phase II detoxification system enzymes. Finally, the Turmeric (Curcuma longa) Extract we use contains the active ingredient curcumin and standardized to contain 97%

curcuminoids. Turmeric functions as a very powerful Phase II activator and supports overall liver detoxification and antioxidant function.*

The Benefits of L-Tox

L-Tox is designed to provide specific and powerful nutrients to insure maximum support for the major detoxification systems in the liver along with healthy nourishing factors. L-Tox is an important dietary supplement for anyone ingesting large amounts of protein, using androgens, testosterone or pro-hormones, consuming alcohol on a regular basis, using prescription and non-prescription drugs or exposed to air pollutants and other environmental chemicals. L-Tox was formulated to complement Max Muscle's other intestinal detoxification and health products including, Max Cleanse & Lean, Max Green Synergy, and Max Glutamine. L-Tox will insure that your liver, gallbladder and intestines are working at optimal function which is essential for peak athletic performance and overall health.*

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

Key References:

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2. Fahey JW, Zhang Y, Talalay P, et al. An exceptionally rich source of inducers of enzymes that protect against chemical carcinogens. *Proc Natl Acad Sci* 1997;94:10367-372.
3. Guler G, Turkozer Z, Tomruk A, Seyhan N. The protective effects of N-acetyl-L-cysteine and epigallocatechin-3-gallate on electric field-induced hepatic oxidative stress. *Int J Radiat Biol* 2008;84:669-80.
4. Li Z, Vance DE. Phosphatidylcholine and choline homeostasis. *J Lipid Res* 2008;49:1187-94.