STRUCTURED LIPIDS

Structured lipids are dietary triglycerides that have had their fatty acids 'restructured' for therapeutic benefits.

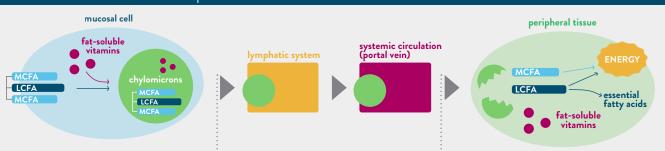
HOW ARE THEY MADE?

- STEP 1 Medium- and long-chain fatty acids (MCFAs and LCFAs) are each attached to a glycerol backbone.
- STEP 2 Enzymes and chemical processes (de-esterification) detach the fatty acids from their glycerol backbone.
- STEP 3 These fatty acids are then randomly rejoined (random re-esterification) to create lipids containing MCFAs and LCFAs on the same glycerol backbone.

ATTACHED DETACH RANDOM REJOIN MCFA MCFA MCFA MCFA MCFA MCFA MCFA MCFA LCFA LCF

HOW DO THEY WORK?

Structured lipids combine the benefits of both MCFAs and LCFAs on the same molecule.



Once ingested, structured lipids are absorbed by the intestinal lumen into the mucosal cell. Within the mucosal cell, they are packaged into chylomicrons with fat-soluble vitamins.

These chylomicrons enter the lymphatic system and pass into the systemic circulation, where they are transported to peripheral tissues.

Peripheral tissues take up contents of the chylomicron, which includes MCFAs, LCFAs, and fat-soluble vitamins. MCFAs are an alternative fuel source for peripheral tissues, which help reduce the loss of lean body mass.¹ LCFAs can be stored and used during times of tissue repair, since MCFAs are supplying tissues with immediate energy.



When lipids are unstructured, MCFAs rarely reach the general circulation and therefore do not provide energy to peripheral tissues.

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1. DeMichele SJ, Bistrian BR. Structured triacylglycerols in clinical nutrition. In: Mansbach CM II, Tso P, Kuksis A, eds. Intestinal Lipid Metabolism. New York: Kiuwer Academic/PlenumPublishers;2001:403-420. |
2. Tso P, et al. Am J Physiol. 1995;268(4 Pt 1):C568-C577. | 3. Tso P, et al. J Nutr. 2001;131(8):2157-2163. | 4. Tso P, et al. Am J Physiol. 1999;277(4 Pt 1):G333-G340. | 5. DeMichele SJ, et al. Matabolism. 1998;37(8):787-795.
6. DeMichele SJ, et al. Am J Chin Nutr. 1989;50(6):1295-1302. | 7. Swenson Esc, et al. Metabolism. 1991;40(1):1152-1159.



WHAT ARE THE BENEFITS?

Structured lipids serve as a readily available energy source.²

PHYSIOLOGIC BENEFITS



Increased fatty acid uptake³



Enhanced fat-soluble vitamin and antioxidant absorption (30%–40%)³



Improved delivery of total fat and essential fatty acids to peripheral tissues $(40\%-50\%)^4$

PHYSIOLOGIC OUTCOMES



Improved nitrogen balance during metabolic stress⁵⁻⁹



Reduced muscle catabolism⁵⁻⁹



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