

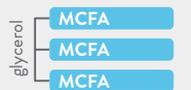
# STRUCTURED LIPIDS

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.

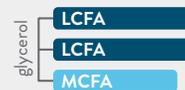
**ATTACHED**



**DETACH**

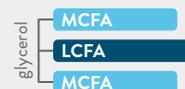
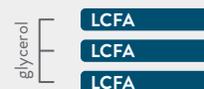
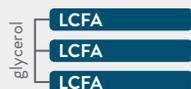


**RANDOM REJOIN**



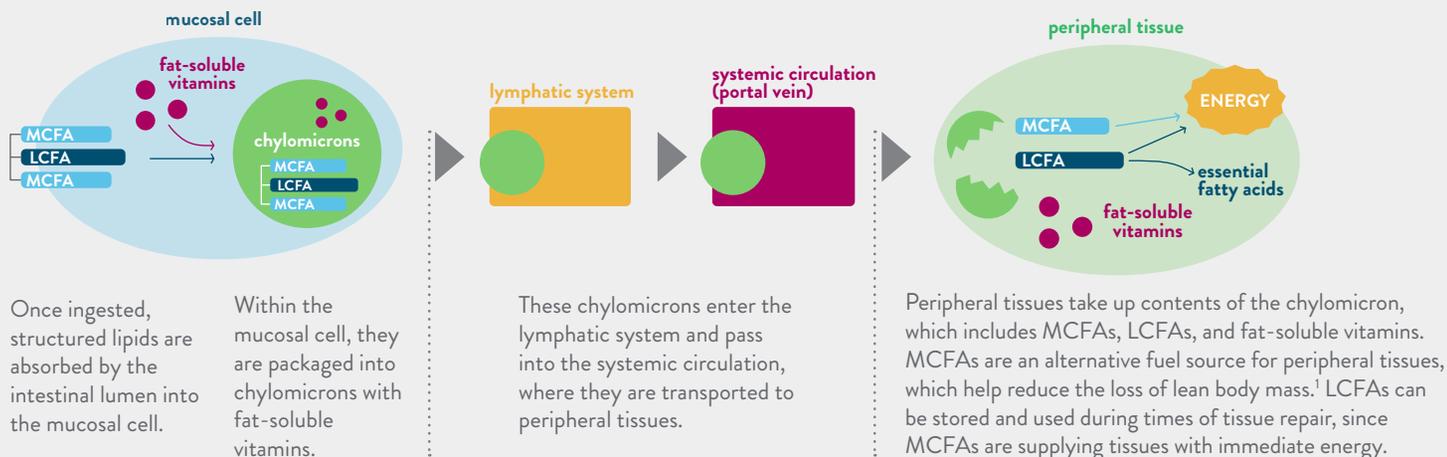
**STEP 2** Enzymes and chemical processes (de-esterification) **detach** the fatty acids from their glycerol backbone.

**STEP 3** These fatty acids are then **randomly rejoined** (random re-esterification) to create lipids containing MCFAs and LCFAs on the same glycerol backbone.



## HOW DO THEY WORK?

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



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

## WHAT ARE THE BENEFITS?

Structured lipids serve as a readily available energy source.<sup>2</sup>

### PHYSIOLOGIC BENEFITS



Increased fatty acid uptake<sup>3</sup>



Enhanced fat-soluble vitamin and antioxidant absorption (30%–40%)<sup>3</sup>



Improved delivery of total fat and essential fatty acids to peripheral tissues (40%–50%)<sup>4</sup>

### PHYSIOLOGIC OUTCOMES



Improved nitrogen balance during metabolic stress<sup>5-9</sup>



Reduced muscle catabolism<sup>5-9</sup>

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1. DeMichele SJ, Bistrain BR. Structured triacylglycerols in clinical nutrition. In: Mansbach CM II, Tso P, Kuksis A, eds. Intestinal Lipid Metabolism. New York: Kluwer Academic/Plenum Publishers;2001:403-420. | 2. Tso P, et al. Am J Physiol. 1995;268(4 Pt 1):G568-G577. | 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. Metabolism. 1988;37(8):787-795. | 6. DeMichele SJ, et al. Am J Clin Nutr. 1989;50(6):1295-1302. | 7. Swenson ES, et al. Metabolism. 1991;40(5):484-490. | 8. Teo TC, et al. Ann Surg. 1989;210(1):100-107. | 9. Teo TC, et al. Metabolism. 1991;40(11):1152-1159.