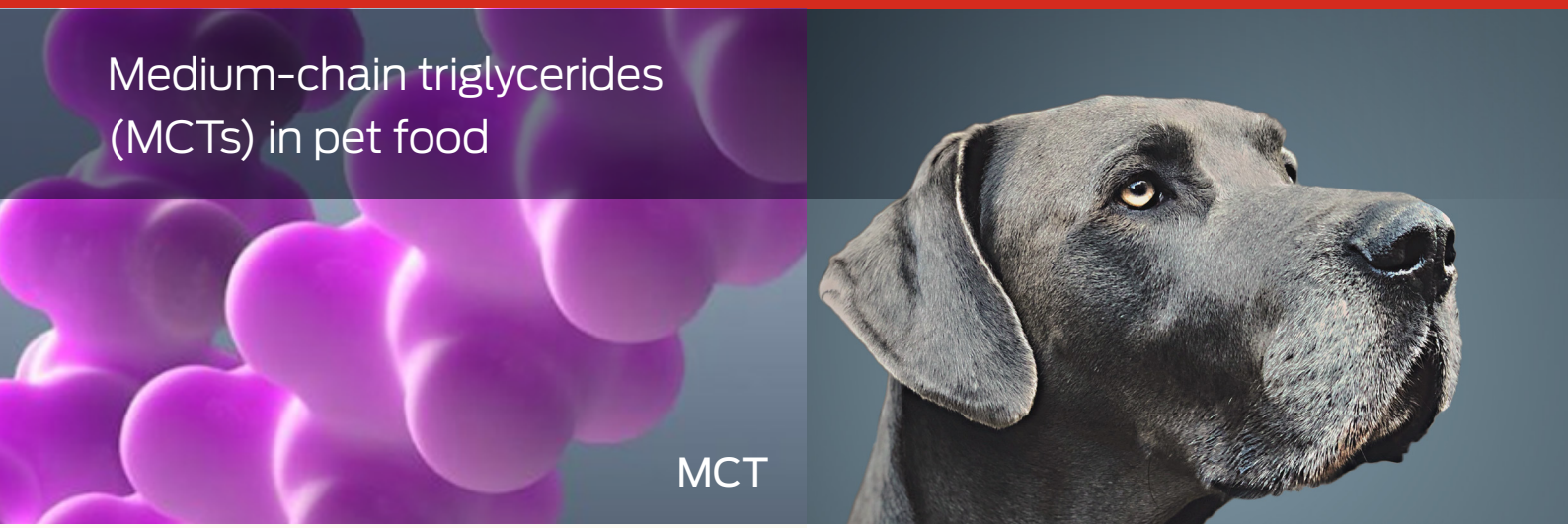
PURINA Institute

Advancing Science for Pet Health

HOT TOPIC

Medium-chain triglycerides (MCTs) in pet food



In focus

Although medium-chain triglycerides (MCTs) do not supply essential fatty acids and thus should not be the only dietary fat source in pet food,[1] studies show supplementing MCTs in the diet can provide health benefits to some dogs.

The Purina Institute provides the scientific facts to support your nutritional conversations.

let's takeback the conversation.

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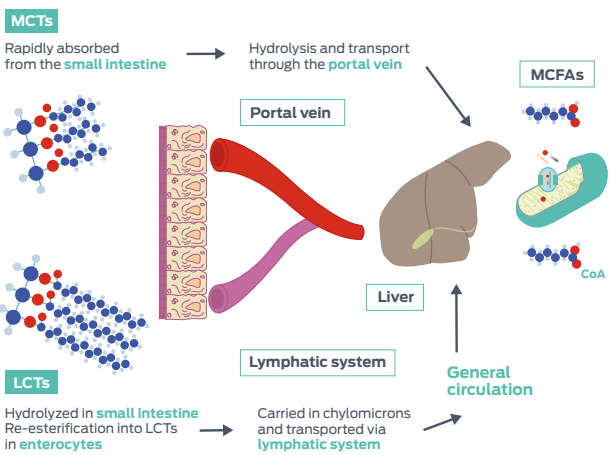
How do MCTs differ from long-chain triglycerides (LCTs)?

MCT fatty acids are 6-12 carbons long, and LCT fatty acids >16 carbons. With shorter fatty acid chains, MCTs:

- are more easily digested, and their fatty acids more rapidly absorbed with most transported directly to the liver via the portal vein[2]
- yield more ketone bodies when oxidized[2]

MCTs are found in coconut and palm kernel oils, LCTs in animal fats and vegetable oils.

Digestion and absorption of MCTs & LCTs



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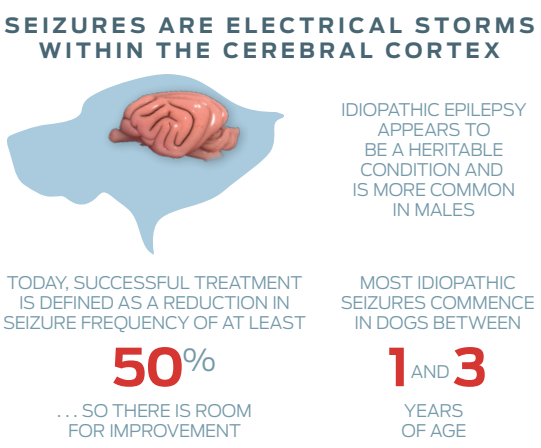
How can an MCT-supplemented diet help dogs?

- **Brain health.** Healthy brains rely primarily on glucose for energy. With age, brain glucose metabolism often becomes inefficient, creating an energy deficiency, with brain regions critical to cognition most affected. Metabolic alongside functional and structural changes may result in age-associated cognitive decline, which may progress to cognitive dysfunction syndrome.[3,4]

  Similarly, in dogs with idiopathic epilepsy, brain glucose metabolism is disrupted, predisposing to more seizures.[5] Cognitive impairment, e.g., memory loss,[6,7] attention deficit hyperactivity disorder-like behaviors,[8] and/or anxious behaviors,[8] may also develop.



  Dietary MCT-derived medium-chain fatty acids (MCFAs) and ketone bodies can provide an alternative source of energy. In addition, the MCFA decanoic acid may inhibit seizures by blocking AMPA excitatory receptors on neurons.[9]

  Purina-supported research demonstrated:

  - Cognitive ability improved in senior dogs fed an MCT-supplemented diet. In contrast to control dogs, MCT diet-fed dogs performed better as the cognitive tests became more demanding. Positive learning changes occurred within the first month.[4]
  - When dogs with refractory idiopathic epilepsy (receiving ≥1 anticonvulsant medication[s]) were fed an MCT-supplemented diet, seizure frequency significantly decreased. Seventy-one percent of dogs improved, with 48% achieving ≥50% reduction in frequency and 14% becoming seizure-free. Improvement was seen as early as day 1.[10] Serum concentrations of anticonvulsant medication(s) were not significantly affected.[10] Adverse behaviors (i.e., chasing and fear towards strangers) declined when dogs were fed the MCT diet.[8]

- **Cardiac health.** For energy, a healthy heart relies mostly on mitochondrial oxidation of LCFAs.[11]

  Research shows dogs with early stage myxomatous mitral valve disease (MMVD) have less efficient cardiac energy production.[12] MCT-derived MCFAs and ketone bodies can act as an alternative energy source.[13]

  Purina research demonstrated:

  - Dogs with asymptomatic MMVD fed a special diet including MCTs were less likely than control dogs to progress from stage B1 to B2. Cardiac left atrial diameter, on average, decreased 3% in dogs fed the special diet, but increased 10% in control dogs.[14]
  - MMVD dogs fed the special diet showed improved energy metabolism, and decreased markers of oxidative stress and inflammation.[15]

- **Gastrointestinal health.** With LCFA maldigestion or malabsorption, e.g., in dogs with chronic enteropathy, exocrine pancreatic insufficiency, liver disease, or lymphangiectasia, a low-fat diet that restricts LCTs is usually fed.[1,16,17] Since fats provide a concentrated form of energy, low-fat diets can be lower in calories, resulting in increased food intake required to meet energy needs. MCTs can serve as another fat source to provide an easily digestible energy source.[1,17]

Can MCTs benefit cats?

Research evaluating optimal dietary inclusion levels and benefits is ongoing. A Purina-funded study showed a diet containing 5.5% MCTs from coconut oil to be palatable and acceptable to cats.[18]

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