

# PALMESTER

Medium Chain Triglycerides

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## PALMESTER

### Medium Chain Triglycerides (MCTs)

KLK OLEO is committed to deliver the best quality and safe product to our customers. Our MCTs are strictly produced in a dedicated production line which minimises cross contamination. Our products are GMO free and derived from renewable resources.

KLK OLEO offers different formats of MCTs, which include oil and powder. MCT oil is graded according to the ratio of caprylic / capric acid. MCT powder is graded according to the MCT oil load.

### Be assured by **PALMESTER**



### Our Brand in the **Global Arena**



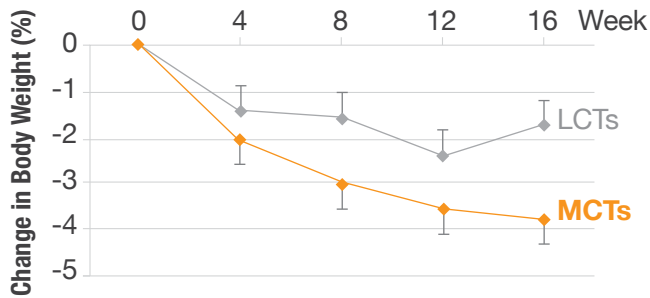
\* PALMESTER 3595, 3585, 3580 & 3575 are ECOCERT COSMOS approved.

## PALMESTER

### Beneficial for Weight Management

Product Code	C8 : C10	Description
PALMESTER 3595	60 : 40	MCT Oil
PALMESTER 3585	70 : 30	
PALMESTER 3550	95 : 5	
PALMESTER 1520 (Coconut Based)	60 : 40	
Oil Load		
PALMESTER MCT Powder	50% / 70%	MCT Powder

### Improve weight loss <sup>1,2</sup>

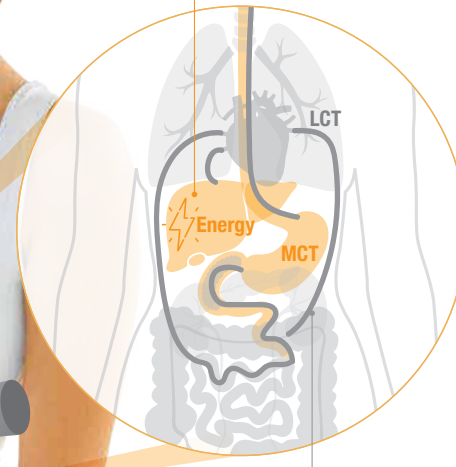


A weight-loss diet that incorporates moderate amounts of MCT oil leads to greater losses of body weight.



Easily absorb and transport throughout the Body

Direct path to the liver, suppresses accumulation of body fat



Body fat accumulation in adipose tissue and muscle

### Bioavailability <sup>3,4</sup>

#### MCTs

Readily metabolised and digested, an excellent source of energy.

- ✓ Short metabolism pathway
- ✓ Do not require lipase and bile salts for digestion
- ✓ Rapid absorption
- ✓ Direct transport to liver, giving an immediate source of energy
- ✓ Do not store as depot fat due to efficiency

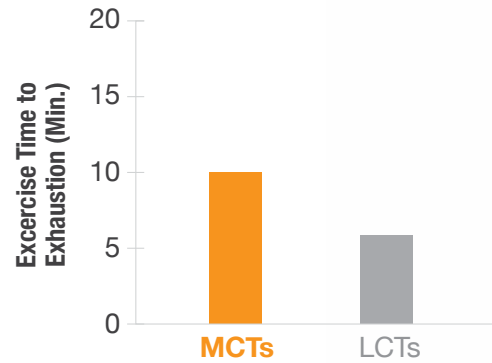
#### LCTs

Digested through a more complex route and stored as fat.

- ⊗ Long metabolism pathway
- ⊗ Require lipase and bile salts for digestion
- ⊗ Slow absorption
- ⊗ Complex digestive process
- ⊗ Store as depot fat in the adipose tissue

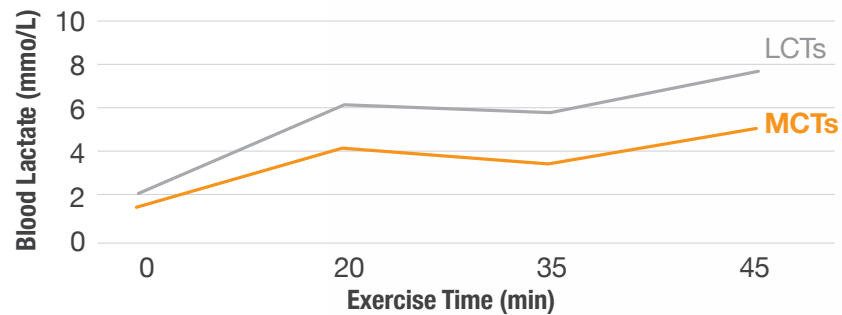
## Energy Booster for Better Athletic Performance

### Improve exercise endurance <sup>2,5</sup>



MCTs are hydrolysed completely to fatty acids for energy generation. Thus, MCTs enhance exercise performance by extending the duration of subsequent high-intensity exercise.

### Reduce lactate buildup in athletes <sup>5</sup>



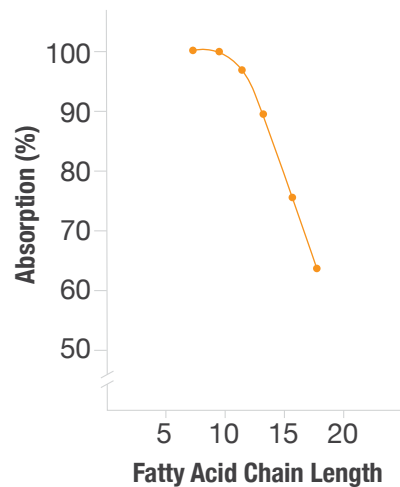
During intense exercise, lactate will start building up in athletes' bloodstream, which causes lactic acidosis. Athletes will have a burning feeling in their muscles, cramps, nausea, and feeling exhausted.



## Fat Substitute for Infant Formula

### Promote better absorption for premature infants <sup>6</sup>

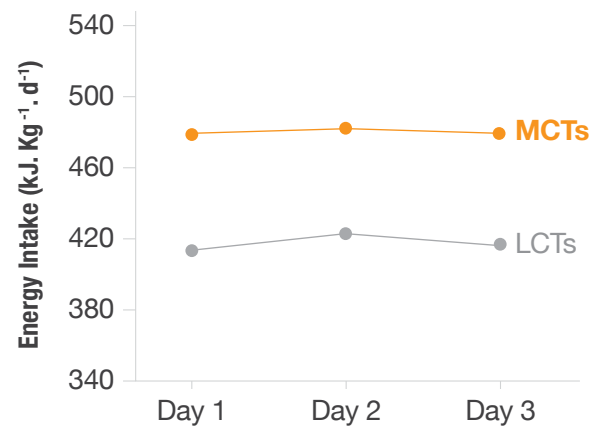
Fat is an integral energy source for premature babies, which is essential for promoting growth in the premature infant and proper development of cell membranes and brain.



MCTs are the preferred source of energy for premature infants. During metabolism, medium chain fatty acids have higher % absorption because they do not require lipase and bile salts for digestion.<sup>7,8,9</sup>

### Improve energy intake in infants <sup>10</sup>

MCTs increase daily energy intake in infants by increasing their average food intake per feeding episode. This might be due to the chemical signals from the intestines or stomach that alter food intake.



Support immature digestive system of premature infants<sup>11</sup>

Improve absorption of calcium and magnesium<sup>12</sup>

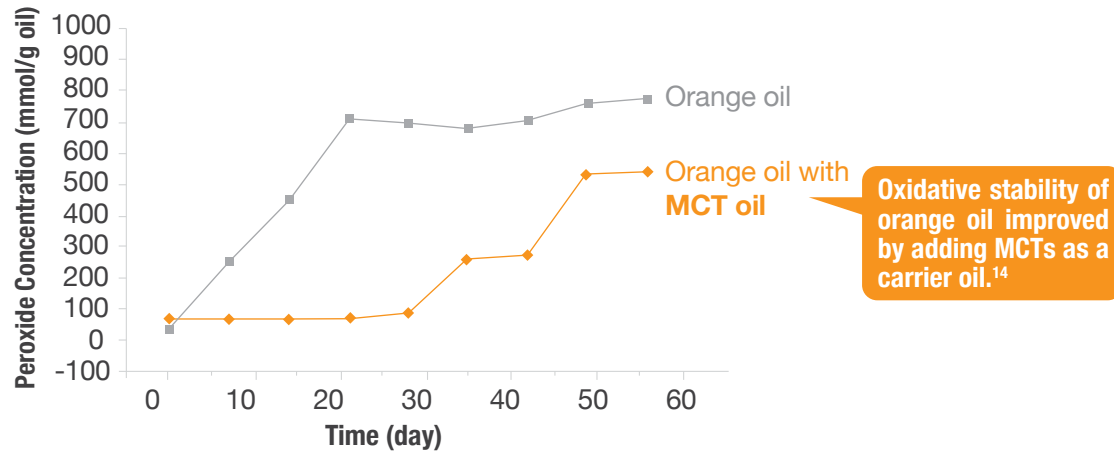
Reduce gastrointestinal infection<sup>13</sup>



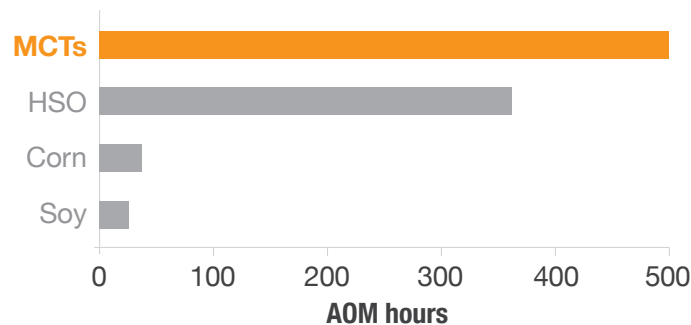
## Solutions for Flavour & Fragrances Industry

MCTs are widely used in flavour & fragrances industries because they are odourless and tasteless, so they do not contribute any off-notes to end products. Another attribute that attracts flavourist to use MCTs as a carrier is the exceptional oxidative stability, which results in extended shelf-life of finished products.

### Excellent carrier for flavour & fragrances



### Good oxidation stability compared to various carrier oils<sup>15</sup>



## Redefine Taste and Health with PALMESTER | PLANTERA MCT Oil for Sauces and Dressings

Sauces and dressings are essential for enhancing the flavour and texture of various dishes, with oil being a key ingredient that contributes to their rich taste and creamy consistency. As consumers increasingly seek healthier options, creating a healthier version of the product without compromising on mouthfeel remains a challenge.

**PALMESTER | PLANTERA MCT Oil** offers the ideal solution for elevating your sauces and dressings. It provides unique metabolic benefits while preserving the rich taste and smooth texture you expect. Additionally, it integrates easily into your formulations without the hassle of extensive reformulation.

### Enhance Every Bite: MCT Oil for Perfect Sauces and Dressings



#### Oil substitution without the need for reformulation

- ☞ Stable emulsion
- ☞ Substitution of up to 40% MCT Oil

#### Optimal rheological behaviour from storage to serving

- ☞ Excellent product quality

#### Sensory experience of sauces & dressings

- ☞ Retains standard product appearance
- ☞ Identical sensory attributes as the standard

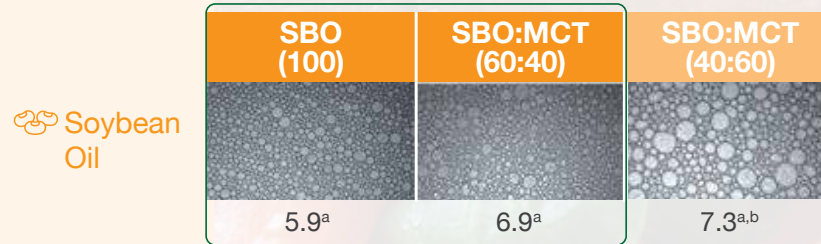
#### Health benefits

- ☞ Energy source
- ☞ Supports weight management

## Emulsion Stability

Emulsion homogeneity and particle size are crucial for stability, appearance, colour, and mouthfeel. The results show that substituting up to 40% of soybean oil with **PALMESTER | PLANTERA MCT Oil** in sauces and dressings helps maintain a well-emulsified product, smooth texture, and consistent visual quality.

### Emulsion Microstructure and Particle Size (µm)

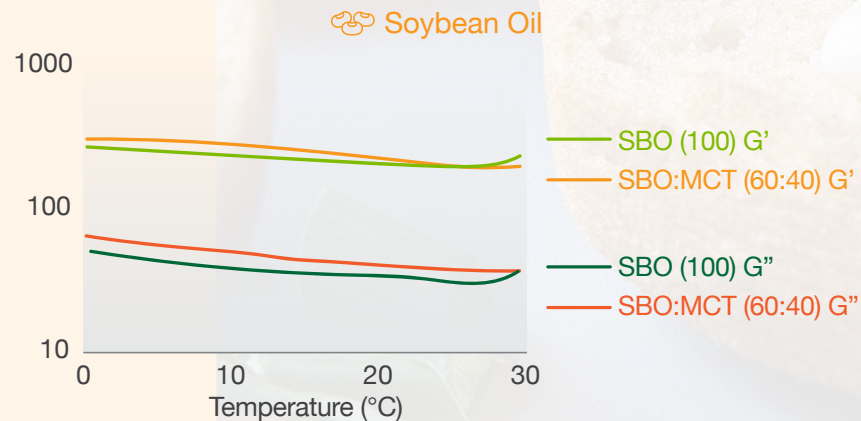


Groups with the same letter are not significantly different ( $p < 0.05$ ), while different letters indicate significant difference among groups.

## Product Quality

Viscoelastic behaviour at different temperatures reflects the product's structural characteristics. **PALMESTER | PLANTERA MCT Oil** inclusion does not significantly alter the structure of sauces and dressings, which remains consistent from storage to serving.

### Viscoelastic Properties – Temperature Sweep



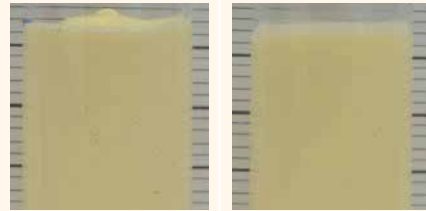
G' (Storage modulus): Elastic properties; G'' (Loss modulus): Viscous properties.

## Product Appearance

Colour variation influences consumer sensory acceptability of sauces and dressings. Replacing traditional oils with **PALMESTER | PLANTERA MCT Oil** does not affect the colour, ensuring the product maintains its original visual appeal.

### Colour Measurement

Colour	Soybean Oil	
	SBO (100)	SBO:MCT (60:40)
L*	83.3	82.4
a*	3.2	3.3
b*	19.3	19.9

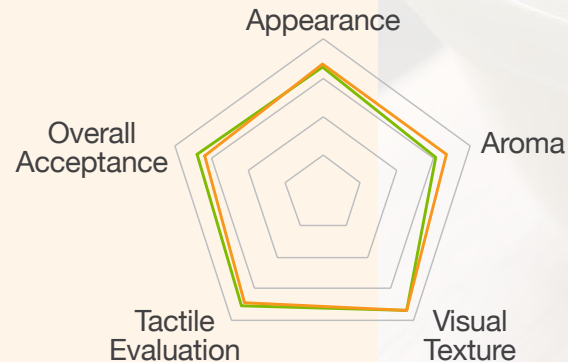


## Sensory

Sensory evaluation with 30 panellists found that sauces and dressings made with **PALMESTER | PLANTERA MCT Oil** were similar to those made with traditional vegetable oils in terms of aroma, visual appearance, and texture. Additionally, the overall acceptability was comparable, with no significant differences noted.

### MCT Oil vs Soybean Oil

— SBO (100) — SBO:MCT (60:40)



# Mayonnaise with PALMESTER | PLANTERA MCT Oil A Formulation Guide

Ingredients	% By Weight
<b>PALMESTER   PLANTERA MCT Oil</b>	30.0
Soybean Oil	45.0
Vinegar	14.5
Egg yolk	8.0
Salt	1.5
Mustard	1.0

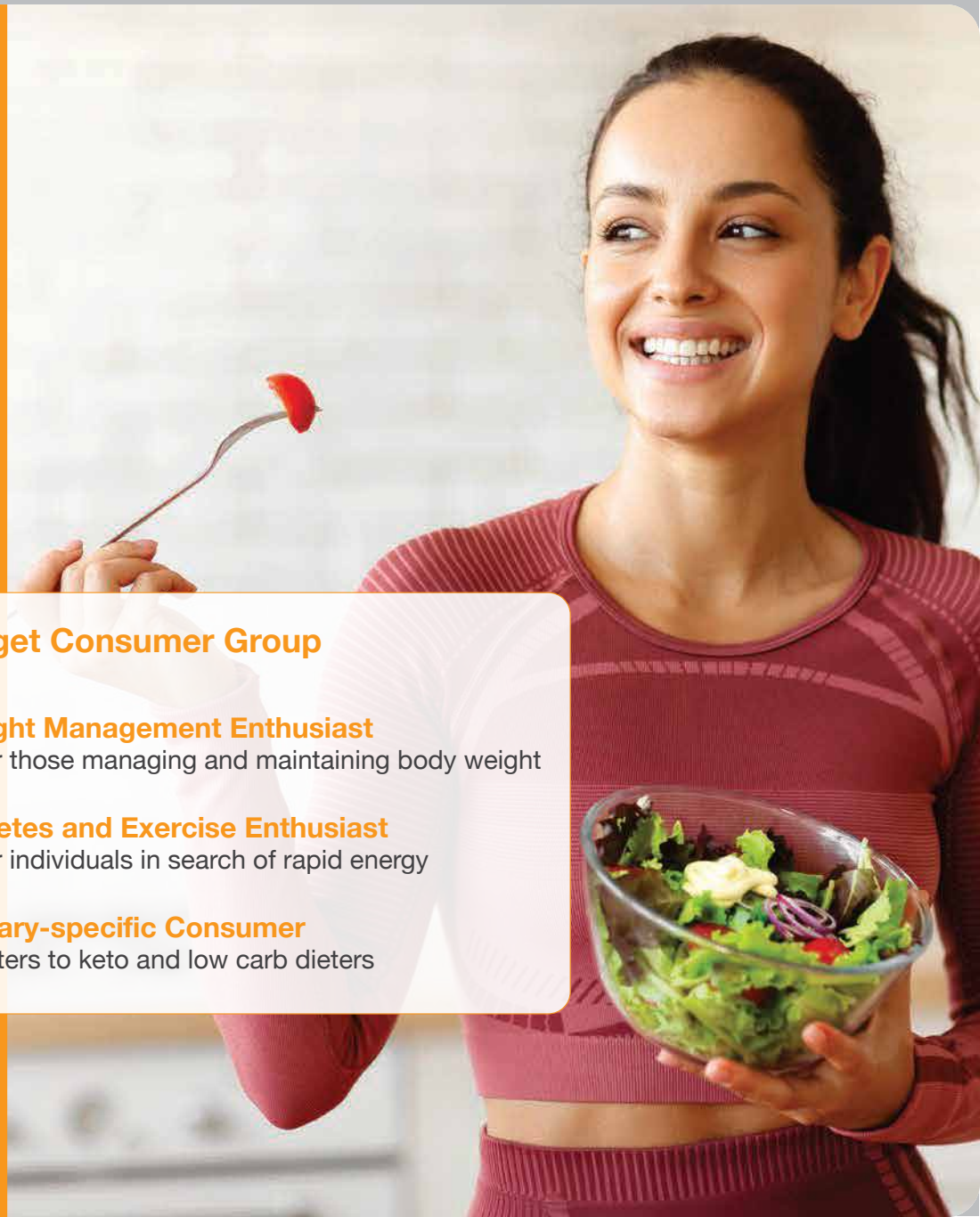
Note: This is a standard recipe for MCT oil mayonnaise; adjustments may be needed based on specific needs or production conditions.

## A Simple Making Guide

- 1. Base Mix**  
Blend egg yolks, salt, and water until uniform.
- 2. Emulsify Oils**  
Gradually add the **PALMESTER | PLANTERA MCT Oil** and soybean oil blend while mixing to form a coarse emulsion.
- 3. Stabilise**  
Incorporate mustard and vinegar or lemon juice. Mix at high speed or homogenise until smooth.
- 4. Pack and Store**  
Transfer into sterilised containers, seal tightly, and refrigerate.

## Target Consumer Group

- Weight Management Enthusiast**  
☑ For those managing and maintaining body weight
- Athletes and Exercise Enthusiast**  
☑ For individuals in search of rapid energy
- Dietary-specific Consumer**  
☑ Caters to keto and low carb dieters



Applications	Functions	Key Features
<b>Food &amp; Beverages</b>		
Chocolate, cocoa and confectionery	<ul style="list-style-type: none"> <li>▸ Reduce calorie</li> </ul>	<ul style="list-style-type: none"> <li>▸ Reduce calories while maintaining good melting behaviour</li> </ul>
Beverages	<ul style="list-style-type: none"> <li>▸ Clouding agent</li> <li>▸ Solubiliser</li> </ul>	<ul style="list-style-type: none"> <li>▸ Low viscosity</li> <li>▸ Water solubility property gives uniform cloud</li> </ul>
Flavour & fragrances	<ul style="list-style-type: none"> <li>▸ Solubiliser / carrier</li> <li>▸ Stabiliser</li> </ul>	<ul style="list-style-type: none"> <li>▸ Clean organoleptic property</li> <li>▸ Solvent for lipophilic materials</li> <li>▸ Excellent oxidative stability</li> </ul>
Light duty frying	<ul style="list-style-type: none"> <li>▸ Nutritional oil</li> </ul>	<ul style="list-style-type: none"> <li>▸ No trans fat</li> </ul>
Gummies, jellies & chewing gums	<ul style="list-style-type: none"> <li>▸ Confectionary glaze</li> <li>▸ Softening agent / plasticiser</li> <li>▸ Anti-sticking agent</li> </ul>	<ul style="list-style-type: none"> <li>▸ Flavour carrier</li> <li>▸ Anti-sticking for easy machinability &amp; good chewing experience</li> <li>▸ Give desirable softening effect for good mouth-feel</li> </ul>
Cereals, crackers & chips	<ul style="list-style-type: none"> <li>▸ Spray oil</li> </ul>	<ul style="list-style-type: none"> <li>▸ Low viscosity for uniform coating, easy spreading</li> <li>▸ Excellent oxidative stability</li> </ul>
Dried fruits	<ul style="list-style-type: none"> <li>▸ Moisture barrier</li> <li>▸ Anti-sticking agent for high sugar, high protein systems</li> </ul>	<ul style="list-style-type: none"> <li>▸ Low viscosity for uniform coating</li> <li>▸ Prevent water loss</li> <li>▸ Anti-sticking</li> </ul>
Powder mixes & seasoning dry blends	<ul style="list-style-type: none"> <li>▸ Anti-dusting agent</li> </ul>	<ul style="list-style-type: none"> <li>▸ Excellent oxidative stability</li> </ul>
Baked goods	<ul style="list-style-type: none"> <li>▸ Fat source</li> <li>▸ Lubricant as a processing aid</li> </ul>	<ul style="list-style-type: none"> <li>▸ Low calorie value</li> <li>▸ Good machinability</li> </ul>
Adult nutrition	<ul style="list-style-type: none"> <li>▸ Energy source</li> </ul>	<ul style="list-style-type: none"> <li>▸ Excellent source of readily metabolised energy</li> </ul>
Infant nutrition	<ul style="list-style-type: none"> <li>▸ Energy source</li> <li>▸ Fat substitute</li> </ul>	<ul style="list-style-type: none"> <li>▸ Excellent source of readily metabolised energy</li> <li>▸ Improve nutrient absorption</li> </ul>
Sport nutrition	<ul style="list-style-type: none"> <li>▸ Energy source</li> </ul>	<ul style="list-style-type: none"> <li>▸ Excellent source of readily metabolised energy</li> </ul>





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