Energetic Efficiency

It usually means that the client is under physical, mental, or emotional stress. While most commonly associated with physical stress from exercise or chronic poor sleep, elevated xanthine can be related to mental and emotional stress. Elevated xanthine can also be a result of excessive caffeine intake.

The client could be experiencing poor athletic performance, muscle fatigue and soreness, slowed recovery, inflammation, or low energy.

Review the recommendation to reduce caffeine intake and increase vitamin C intake in the nutrition section of the report. Consider reducing caffeine intake and focusing on maintaining hydration.

It is important to ensure carbohydrate intake is supporting energy expenditure, especially for those who are exercising regularly. Consider including nutrient-dense carbohydrates like sweet potatoes, squash, and berries with meals, especially on days of exercise.

**SMART Goal example:**
- I will eat 1 cup of berries every day this week.

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**Why Xanthine is important:**
Xanthine (XAN) is a metabolite of the purine pathway and functions in the digestive tract to induce hydrochloric acid production and promote the secretion of pepsin from cells lining the stomach. Both of these processes help to break down consumed food.

Xanthine is a mild stimulant found in coffee, cola, and green tea. Xanthine is linked to heart rate and heart health. Xanthine accumulation during strenuous cardiovascular exercise can limit energy output, affecting athletic performance.

**Xanthine is involved in calculating scores for:**
- Energetic Efficiency

**When Xanthine is ABOVE optimal levels:**
- It usually means that the client is under physical, mental, or emotional stress. While most commonly associated with physical stress from exercise or chronic poor sleep, elevated xanthine can be related to mental and emotional stress. Elevated xanthine can also be a result of excessive caffeine intake.
- The client could be experiencing poor athletic performance, muscle fatigue and soreness, slowed recovery, inflammation, or low energy.
- Review the recommendation to reduce caffeine intake and increase vitamin C intake in the nutrition section of the report. Consider reducing caffeine intake and focusing on maintaining hydration.
- It is important to ensure carbohydrate intake is supporting energy expenditure, especially for those who are exercising regularly. Consider including nutrient-dense carbohydrates like sweet potatoes, squash, and berries with meals, especially on days of exercise.
- **SMART Goal example:**
  - I will eat 1 cup of berries every day this week.

**When Xanthine is BELOW optimal levels:**
- It usually means that the client is not including a variety of purine-rich foods like animal protein, seafood, and shellfish.
- The client could be experiencing indigestion, slowed digestion, or low energy.
Xanthine (XAN)

When Xanthine is BELOW optimal levels (continued):

- In the gut, xanthine increases hydrochloric acid and pepsin secretion, which aids digestion. Focus on habits that support digestion, such as eating small meals and walking after eating, and encourage eating habits that support the gut microbiome, like including fermented foods and avoiding processed meat and sugary beverages. If the client experiences slow digestion, they may benefit from a small serving of caffeine. If the client is currently not including caffeine but feels comfortable including it, start with one 6- to 8-ounce cup of caffeinated tea or coffee per day. Avoid caffeinated beverages if the client has a known sensitivity to caffeine.

- Review the recommendation to include more purine-rich foods in the nutrition section of the report. Consider supporting the client in including 1 or more servings of seafood or shellfish each week.

- SMART Goal example:
  - I will make a [shrimp dish](#) on Sunday and have the leftovers for lunch on Monday and Wednesday this week.

More About Xanthine:

- Xanthine is part of [Ixcela’s Stress Group](#) when it is above optimal levels. This is because it is associated with overexertion, inflammation, and joint pain.

- When xanthine is above optimal levels, it is important to ensure fluid intake is adequate. Increase intake depending on thirst and exercise intensity. If the client tends to sweat profusely, consider suggesting the use of an electrolyte replacement in their water during exercise.

- Xanthine is part of [Ixcela’s Nutrient Group](#) when it is below optimal levels. This is because it is commonly associated with a low intake of protein-dense or purine-rich foods.

- If xanthine is below optimal levels and 3-methylxanthine is within optimal levels, consider adding a small amount of caffeine. The addition of caffeine (coffee, cocoa, or tea) can support gut motility, improve digestion, and alleviate constipation.

- [Strenuous exercise can affect xanthine levels](#). To support strenuous exercise, review the Personalized Daily Meal Plan to ensure adequate calorie, carbohydrate, and protein intake.

- [Exercise-induced stress can be detrimental to the gut microbiome](#). Evaluate the frequency of intense exercise to avoid damage to the gut, and if xanthine levels are high, consider incorporating restorative practices like meditation, stretching, or relaxing walks.

- Review the other purine metabolites, uric acid and 3-methylxanthine, if xanthine is not within optimal levels. Supporting these metabolites will also support xanthine.