

Unimate

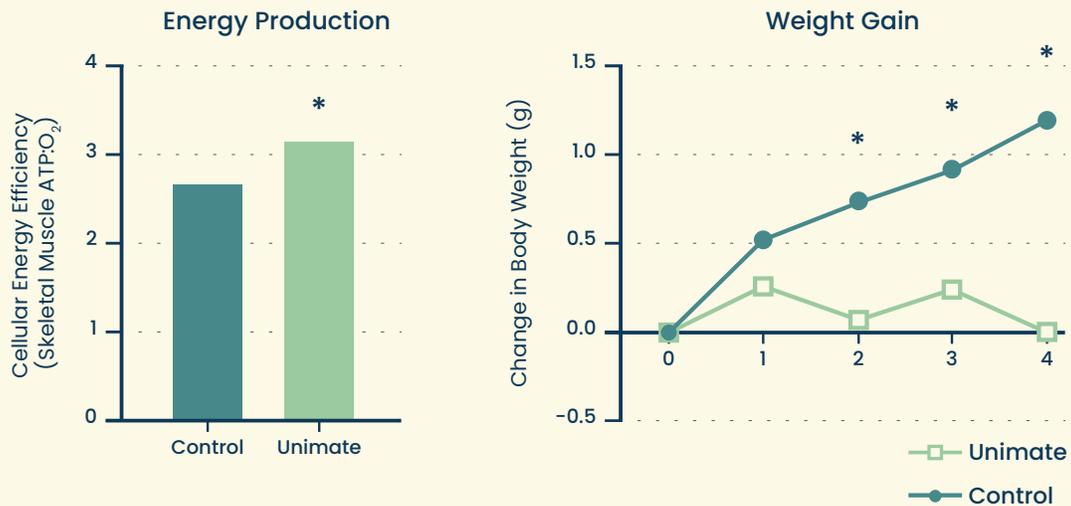
a yerba mate supplement,
prevents weight gain and
improves cellular energy
production and antioxidant
levels in the body



UNICITY

Summary

Unimate consumption optimizes cellular metabolism and antioxidant levels in the body. In this unique study, measurements in fatty tissue, skeletal muscle, and the liver, tissues highly relevant to whole-body metabolism, were taken over four weeks. Results showed that Unimate prevented weight-gain and improved energy production efficiency in muscle, while burning more energy in fat cells. In addition, changes in the liver showed improved antioxidant levels, suggesting Unimate's protective effects against oxidative stress and the optimization of cellular function. Study data indicates the beneficial effects of Unimate supplementation on energy production, fat cell metabolism, and oxidative stress, all of which are protective against obesity.



Authors:

Chase Walton¹, Erin Saito¹, Cali Warren¹, John Larsen¹, Nicole Remund¹,
Dr. Stephanie Kung², Dr. Paul Reynolds¹, Dr. Jason Hansen¹, and Dr. Ben Bikman¹

¹Department of Cell Biology and Physiology, Brigham Young University, Provo, UT

²Research and Development, Unicity International, Provo, UT

Background

The unabated rise in heart disease, obesity, and type 2 diabetes mellitus necessitates the use of novel approaches to reduce associated risk factors. Yerba mate, an herbal tea derived from the leaves of the *Ilex paraguariensis* plant, is reported to be protective against these obesity-related and other cardiometabolic disorders [1-3]. Unimate is a dietary supplement prepared from a proprietary extract of the yerba mate plant, and contains high levels of

naturally-occurring chlorogenic acids, methylxanthines, and triterpene saponins. Unimate has been demonstrated to support appetite control and improve markers of cardiometabolic health, including triglycerides, glycated hemoglobin, and blood lipids. This study investigated the effects of four weeks of Unimate consumption on body weight and tissue-specific metabolism.

Methods

Healthy adult mice were randomly divided into two groups (10 per group (N), 5 male, 5 females) and given Unimate or water (Control), and a standard diet for four weeks ad libitum. Body weights were measured and recorded weekly. After four weeks, markers for cellular energy production (ATP), metabolism (ATP:O₂), and antioxidant

levels (GSH/GSSG) were quantified in the skeletal muscle, subcutaneous fat, and liver.

Data are presented as the means ± SEM. The differences between Control and Unimate were compared using students' t-test. Significance was determined as being at $p < 0.05$

Water vs Unimate

Results

Unimate consumption prevents weight gain in males and females

Over four weeks, the Control group gained a significant amount of weight compared to the Unimate group (Figure 1), which displayed no significant changes relative to their starting weight.

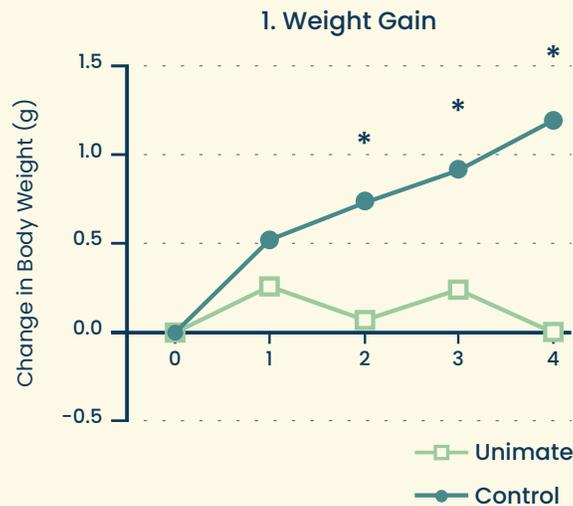


Figure 1. Unimate consumption prevents weight gain. Body weight was measured weekly over the four weeks of Unimate treatment and normalized to initial weights at week 0. N = 10 per group. * p < 0.05.

Unimate decreases energy production efficiency in white adipose tissue, inducing fat loss

Unimate consumption promoted a more energetically inefficient state in fat cells, where oxygen consumption rates were higher and ATP production was lower with Unimate ($p = 0.0434$, data not shown), suggesting mitochondrial uncoupling and a loss of energy as heat. This phenomenon induces fat loss in humans and is consistent with studies that demonstrate yerba mate stimulates mitochondrial biogenesis, thermogenesis, and white adipose “browning” [1].

Unimate consumption increases cellular energy production and efficiency in skeletal muscle

There was a significant increase in cellular energy (ATP) output in the skeletal muscle with Unimate, but not water (Figure 2A, $p = 0.0023$). Energy output relative to oxygen consumption ($\text{ATP}:\text{O}_2$), an indicator of metabolic efficiency, was also significantly increased with Unimate (Figure 2B, $p = 0.0332$).

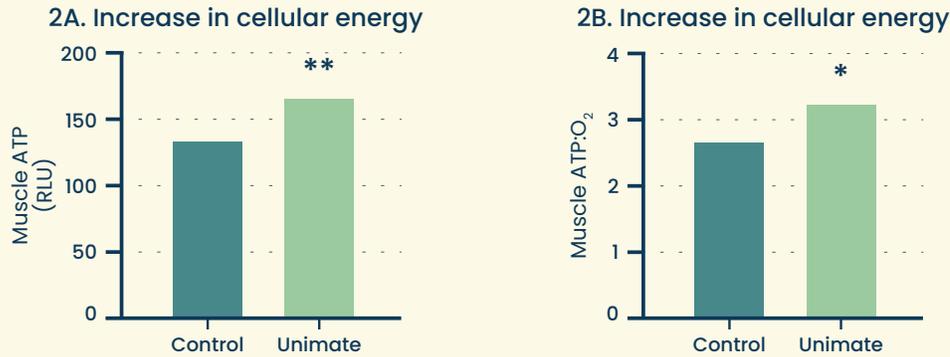


Figure 2. Unimate improves cellular energy production and efficiency in skeletal muscle. ATP concentration was quantified (A), and ATP production relative to oxygen consumption (B) was calculated ($N = 6$ per group). * $p < 0.05$, ** $p < 0.01$.

Unimate consumption increases intracellular antioxidant levels in the liver

Consumption of Unimate resulted in a significant increase in the intracellular antioxidant glutathione (GSH) (Figure 3A, $p = 0.0449$) and a significant increase in antioxidant potential in the liver glutathione / oxidized glutathione (GSH/GSSG) (Figure 3B, $p = 0.0251$). While lower GSH/GSSG is associated with metabolic pathologies such as obesity, insulin resistance, and cardiovascular disease, higher GSH/GSSG has been associated with liver-protective effects and a greater capacity to withstand oxidative stress[4].

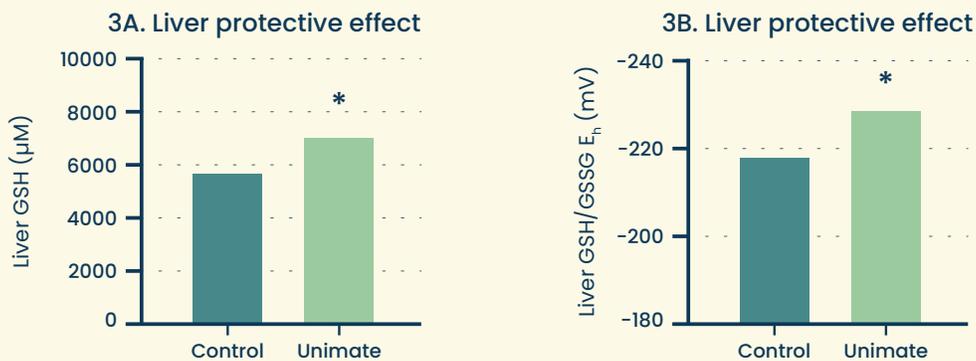


Figure 3. Unimate consumption alters liver antioxidant levels. Concentrations of the antioxidant glutathione (GSH, (A)) and oxidized glutathione (GSSG, (data not shown)) were quantified. GSH/GSSG, an indicator of intracellular antioxidative potential, was greater with Unimate consumption (B); ($N = 8$ per group). * $p < 0.05$.

Conclusion

Unimate consumption has demonstrated protective properties against weight gain over four weeks. This was observed via an increased energy output efficiency within skeletal muscle, and increased metabolic flux in fat cells. In addition, liver antioxidant levels were elevated with Unimate consumption, indicating a greater protection against oxidative stress.

Unimate supplementation can be an accessible means of potentially improving metabolic function and protecting against obesity and other metabolic disorders.

References

1. Andrade, V.M.d.M.; de Moura, A.F.; da Costa Chaves, K.; da Rocha, C.P.D.; de Andrade, C.B.V.; Trevenzoli, I.H.; Ortiga-Carvalho, T.M.; Barcellos, L.C.; Vaisman, M.; Salerno, V.P. Yerba mate consumption by ovariectomized rats alters white adipose tissue. *Mol. Cell. Endocrinol.* 2023, 564, 111881.
2. Harrold, J.A.; Hughes, G.M.; O'Shiel, K.; Quinn, E.; Boyland, E.J.; Williams, N.J.; Halford, J.C.G. Acute effects of a herb extract formulation and inulin fibre on appetite, energy intake and food choice. *Appetite* 2013, 62, 84–90.
3. Andersen, T.; Fogh, J. Weight loss and delayed gastric emptying following a South American herbal preparation in overweight patients. *J. Hum. Nutr. Diet.* 2001, 14, 243–250.
4. Ballatori N, Krance SM, Notenboom S, Shi S, Tieu K, Hammond CL. Glutathione dysregulation and the etiology and progression of human diseases. *Biol Chem.* 2009;390(3):191–214. doi:10.1515/BC.2009.033