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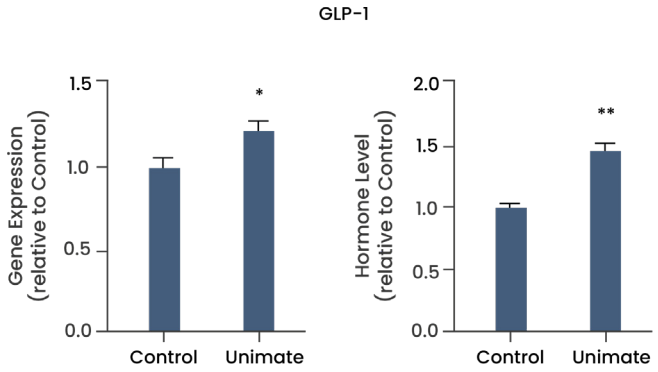
Daily Unimate intake and the gut microbiome upregulate natural GLP-1 in the body

A preclinical study was conducted to evaluate the effects of Unimate on glucagon-like peptide-1 (GLP-1) and gastric inhibitory polypeptide (GIP). Additionally, we investigated the potential mechanism of action driving the incretin response. Experimental groups received either water or Unimate daily for four weeks. Study results showed that Unimate significantly increased GLP-1 gene expression in the gut and GLP-1 levels in circulation. This effect is thought to be driven by the activity of the gut microbiota, which converts a natural compound from Unimate into a bioactive metabolite that directly promotes GLP–1 production.



Background

Chronic metabolic conditions like obesity and type 2 diabetes are on the rise worldwide, and the prescription drugs used to manage these conditions are costly and frequently cause undesirable side effects. Consequently, natural alternatives may offer a more reliable and tolerable way to combat metabolic dysfunction. In particular, Unimate, a yerba maté-based dietary supplement, is rich in bioactive compounds that have been demonstrated to support metabolic health. Moreover, Unimate may modulate the body's incretin response. Glucagon-like peptide-1 (GLP-1) and gastric inhibitory polypeptide (GIP) are two incretin hormones secreted by intestinal cells, and both hormones play an important role in regulating blood sugar, appetite, and insulin. Thus, the purpose of this study was to explore the incretin effect of Unimate and to identify the key bioactive compounds involved in this pathway.

Methods

Healthy, male and female mice were randomly divided into two groups (n = 6, three of each sex) and given Unimate or water (Control) for four weeks. After four weeks, gene expression of GLP-1 and GIP in the small intestine was measured, and plasma levels of the active hormones were quantified. At the same time, an in vitro model of GLP-1 production (GLUTag L-cells) was used to examine whether Unimate or its metabolites directly stimulate GLP-1 secretion.

This study was conducted in accordance to established ethical standards and approved by the Institutional Animal Care and Use Committee at Brigham Young University (protocol #20-0203).

Data are presented as the means ± SEM. The differences between Control and Unimate were compared using unpaired Student's t-tests or one-way ANOVA followed by Tukey's post hoc test, as appropriate. Significance was determined as being at $p < 0.05$, a trend toward significance signaled by $p < 0.1$.

12 mice	2 different groups	4 weeks

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Results

Unimate enhances GLP-1 expression and secretion
Unimate supplementation led to a significant increase in intestinal GLP-1 gene expression compared to Control, and plasma levels of active GLP-1 were likewise elevated. Intestinal GIP expression and plasma GIP levels did not differ between the experimental groups (data not shown).

Unimate's effect on GLP-1 is dependent on the gut microbiome
In the cell culture experiments, the intestinal cells exposed to ferulic acid increased GLP-1 expression, while those exposed to dihydroferulic acid strongly increased GLP-1 secretion by more than 2.5 times. Ferulic acid is a natural compound in Unimate, and dihydroferulic acid is a downstream microbial metabolite of ferulic acid. These findings support the idea that the gut microbial conversion of Unimate is a key step in triggering enhanced GLP-1 release in the gut.

Figure 1

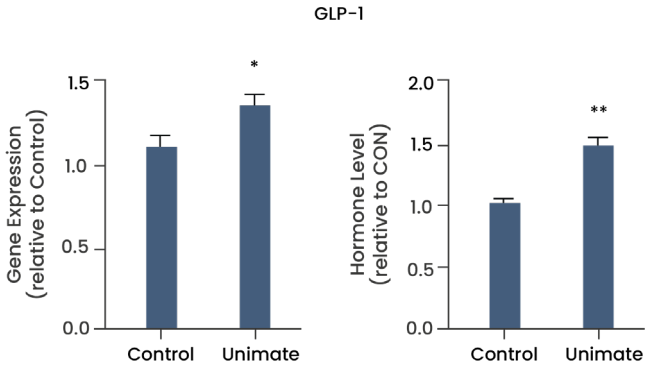

Figure 1. Unimate increases GLP-1 expression in intestinal cells (A) and levels of GLP-1 in the plasma (B). (Control, n = 6; Unimate, n = 6. *p < 0.05 vs. CON, **p < 0.01 vs. CON)

Figure 2

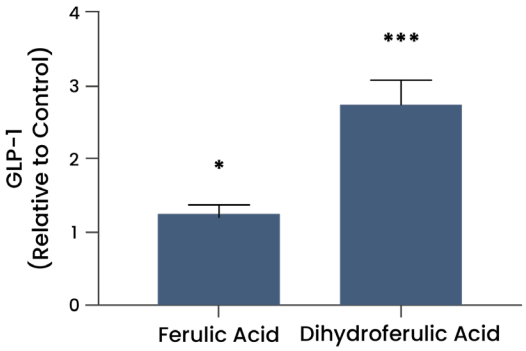

Figure 2. Effects of ferulic acid and dihydroferulic acid on GLP-1 secretion in intestinal cells. The microbial metabolite dihydroferulic acid strongly stimulates GLP-1 secretion. (Control, n = 6; Stronghold, n = 6. *p < 0.05 vs. CON, *** p < 0.001 vs. CON)

Conclusion

Unimate may selectively upregulate endogenous GLP-1 in the body via the activity of the gut microbiome. The potent effect of the metabolite dihydroferulic acid points to a critical role for the gut microbiome in mediating the beneficial effects of Unimate. Though further clinical research is needed, these findings highlight yet another mechanism through which Unimate beneficially supports metabolic health.

References

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