



## For Reduced Stress and Improved Mood

### What is SerenZea™

SerenZea™ is a Zea mays (corn leaf)-derived, patented, clinically proven stress and mood health support ingredient that contains proprietary standardized natural compounds. SerenZea™ is clinically proven to reduce levels of a stress hormone, cortisol, and improve mood health.

Corn leaves contain a naturally occurring compound called 6-methoxybenzoxazolinone (6-MBOA), which can act as a positive regulator of serotonin levels, leading to reduced cortisol and ameliorated mood health.

### Applications\*

- Relieves mild to moderate everyday low mood
- Provides positive mood support and enhances emotional well-being
- Clinically proven to maintain a healthy level of cortisol
- Addresses occasional mental stress and mood swings

### Key Benefits\*

- Once-a-day dosing increases consumer compliance
- High compatibility in formulating with other ingredients
- Natural source of plant with a long history of safe human use
- Extensive in vivo safety testing with no adverse effects
- Patent protected

### What makes SerenZea™ unique?

- SerenZea™ is known to contain biologically active compounds proven to induce rate limiting enzymes in the biosynthesis of serotonin.
- SerenZea™ was shown to be efficacious in reducing a stress hormone, cortisol, in human clinical studies.
- SerenZea™ was shown to improve overall mental well-being as it was measured by the Profile of Mood States (POMS) in human clinical studies.
- SerenZea™ was shown to be efficacious supporting mood and mental stress in human clinical studies.
- SerenZea™ is a naturally stable molecule, which improves shelf life and reduces overage required in formulation.

### Plant Origin

Derived from leaves of Zea mays (corn or maize).

### Formulation

Can be used as an active agent in tablets, capsules, liquids, powders, bars, gummies, gels, RTD and other delivery systems.

### Physical Properties

Brown powder.

# Mechanism of Action

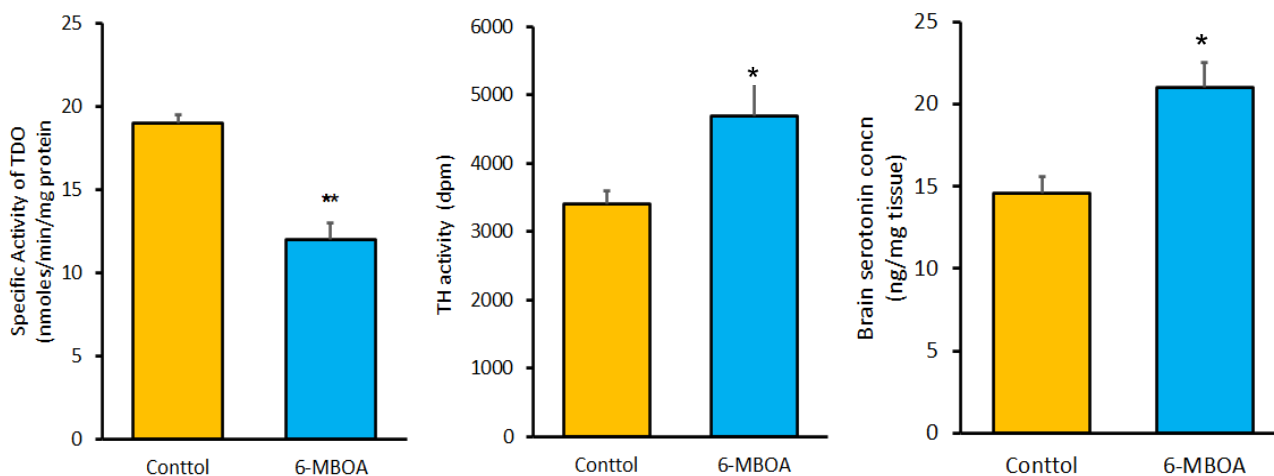


Figure 1: SerenZea™ increases biosynthesis of serotonin. \*\*P ≤ 0.001 vs control; \*p ≤ 0.5 vs control

## Patents

- US 6,667,308 B2
- US 7,794,761 B2
- US 7,507,731 B2
- US 7,521,467 B2
- US 7,524,877 B2
- US 7,541,356 B2

## Clinical Data on Sleep Quality and Mood

### Summary Highlights

- SerenZea™ shows significant improvement in ameliorating occasional minor mood changes among adults with mild to moderate susceptibility to mood changes.
- SerenZea™ showed a statistically significant dose-correlated reduction in salivary cortisol level compared to baseline and Placebo.
- SerenZea™ supplementation improved overall well-being as measured by Profile of Mood States (POMS) scale.
- SerenZea™ is effective at supporting mood and well-being at a small serving size and once-a-day dosage.
- Safe for human consumption at the recommended daily dosages.
- Non-habit forming and safe natural mood ingredient.\*
- Substantiated by 2 clinical trials with 2 peer reviewed publications.



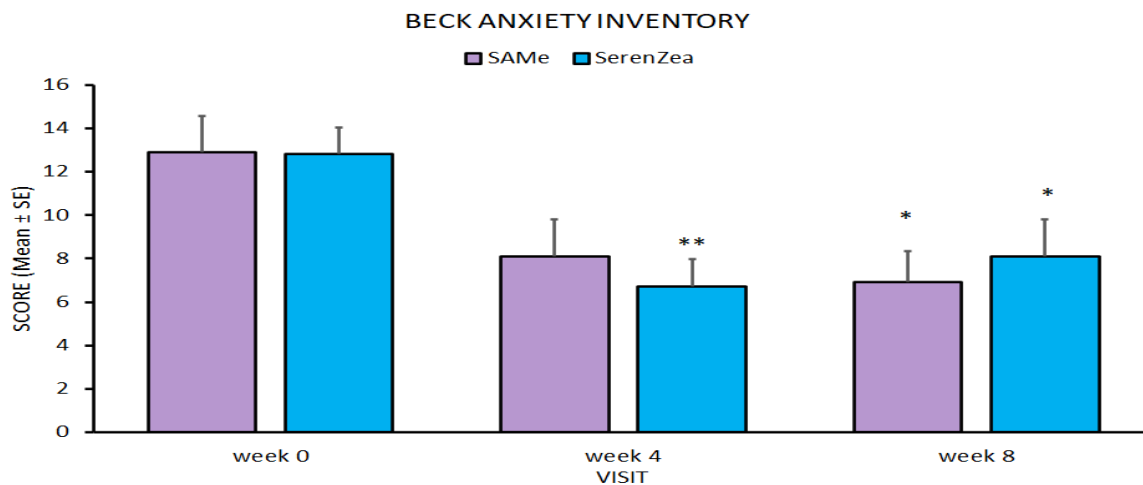


Figure 2: SerenZea™ shows significant improvement in ameliorating minor feelings of stress. \*\* $p \leq 0.001$  vs baseline; \* $p \leq 0.05$  vs baseline

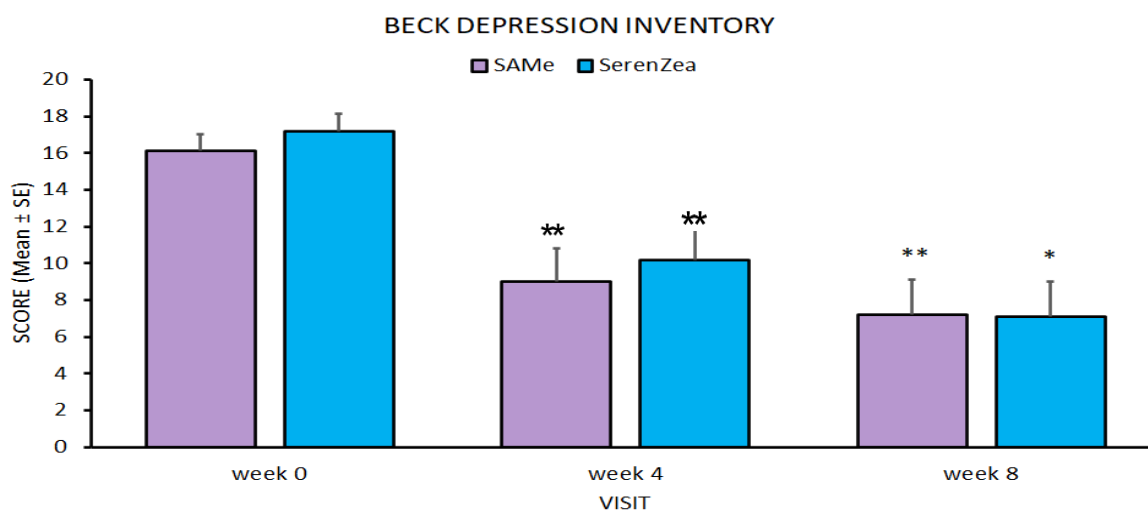


Figure 3: SerenZea™ shows significant improvement in reducing minor mood changes \*\* $p \leq 0.001$  vs baseline; \* $p \leq 0.05$  vs baseline

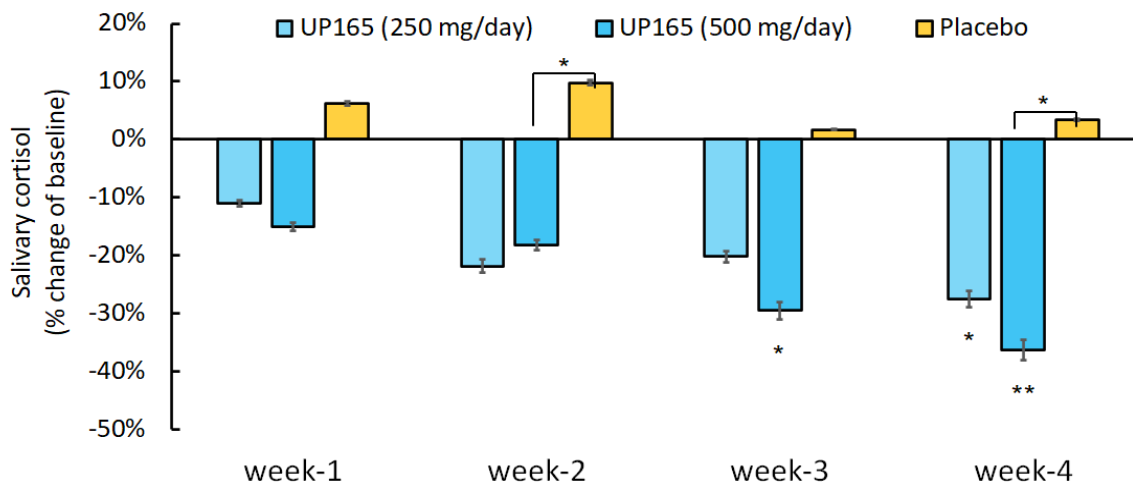


Figure 4: Percentage changes of salivary cortisol levels from supplements of 3 test articles; \*  $P < 0.05$ ; \*\*  $P \leq 0.001$  vs Placebo or baseline

Table 1:

Group	N	Psychological Mood State Subscales (POMS)					
		(% difference from baseline)					
		Vigor	Anger	Confusion	Fatigue	Feelings of Sadness	Tension
UP165 (250 mg/day)	14	+2%	-37%	-40%*	-43%*	-58%*	-37%*
UP165 (500 mg/day)	13	+5%	-23%	-38%*	-42%*	-36%*	-36%*
Placebo	15	-2%	-19%	-15%	-9%	-14%	-14%

**Conclusion:** There was a clear and consistent benefit of SerenZea™ (UP165) in lowering stress hormone exposure (salivary cortisol – indicating improved stress resilience) and improving feelings of mental well-being, particularly with 36%-58% less tension, fatigue, confusion, and minor feelings of sadness from subjects orally supplemented with SerenZea™. Unlike the salivary cortisol level, there was no dose-correlation in improvement of the profile of mood state. The efficacious dosage for improving mood well-being was 250 mg/day SerenZea™ (UP165 corn grass leaf extract; Zea mays) though a higher dosage at 500 mg/day showing quicker effects and a more consistent reduction of stress hormone.\*

## References

1. Kalman DS, Feldman S, Vazquez RR, Krieger DR. A Prospective Randomized Double-Blind Study Evaluating UP165 and S-Adenosyl-L-Methionine on Depression, Anxiety and Psychological Well-Being. *Foods* 2015, 4, 130-139; doi:10.3390/foods4020130.
2. Gupta, A.; Sharma, P.K.; Garg, V.K.; Singh, A.K.; Mondal, S.C. Role of Serotonin in Seasonal Affective Disorder. *Eur Rev Med Pharmacol Sci*. 2013, 17, 49–55. 24.
3. Ng JY, Nazir Z, Nault H. Complementary and alternative medicine recommendations for depression: a systematic review and assessment of clinical practice guidelines. *BMC Complement Med Ther*. 2020 Oct 7;20(1):299.
4. Qureshi NA, Al-Bedah AM. Mood disorders and complementary and alternative medicine: a literature review. *Neuropsychiatr Dis Treat*. 2013;9: 639–58.
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6. Walther, D.J.; Peter, J.U.; Bashammakh, S.; Hörtnagl, H.; Voits, M.; Fink, H.; Bader, M. Synthesis of serotonin by a second tryptophan hydroxylase isoform. *Science* 2003, 299, 76.

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