

# Abstract

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## Dietary amelioration of locomotor, neurotransmitter and mitochondrial aging

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**OBJECTIVE:** Aging degrades motivation, cognition, sensory modalities and physical capacities, essentially dimming zestful living. Bradykinesia (declining physical movement) is a highly reliable biomarker of aging and mortality risk.

**METHODS AND RESULTS:** Mice fed a complex dietary supplement (DSP) designed to ameliorate five mechanisms associated with aging showed no loss of total daily locomotion compared with >50% decrement in old untreated mice. This was associated with boosted striatal neuropeptide Y, reversal of age-related declines in mitochondrial complex III activity in brain and amelioration of oxidative stress (brain protein carbonyls). Supplemented mice expressed ~50% fewer mitochondrial protein carbonyls per unit of complex III activity. Reduction of free radical production by mitochondria may explain the exceptional longevity of birds and dietary restricted animals and no DSP is known to impact this mechanism.

**CONCLUSION:** Functional benefits greatly exceeded the modest longevity increases documented for supplemented normal mice. Regardless, for aging humans maintaining zestful health and performance into later years may provide greater social and economic benefits than simply prolonging lifespan. Although identifying the role of specific ingredients and interactions remains outstanding, results provide proof of principle that complex dietary cocktails can powerfully ameliorate biomarkers of aging and modulate mechanisms considered ultimate goals for aging interventions.

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