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Enhancing Silk Yield: The Impact of Essential Amino Acid Supplementation on *Bombyx mori* L.

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ABSTRACT

Silkworm (*Bombyx mori* L.) cocoon production depends on the quality and quantity of mulberry leaves consumed. Any variation in nutritional supply, particularly amino acid content, directly affects cocoon yield. This study examines the impact of essential amino acids on the biological, economic, and biochemical traits of *B. mori*. Two mulberry varieties, Ichinose and Goshoerami, were analyzed for amino acid composition using LC-MS and spectrophotometry. Larvae were fed mulberry leaves coated with methionine, lysine, and tryptophan solutions (0.5%, 1.0%, and 1.5%), and their traits were compared to control groups. Methionine supplementation at 0.5% consistently improved biological traits (larval weight, silk gland weight, silk productivity) and economic traits (larval duration, cocoon yield, shell percentage, filament length). Biochemical analysis showed increased total protein, free amino acids, and antioxidant activity in hemolymph and silk gland tissues, with elevated amino acid levels in supplemented groups. These findings highlight the potential of essential amino acid supplementation, particularly methionine, in optimizing silkworm performance and enhancing silk production, offering promising prospects for sustainable sericulture.

Keywords: *Bombyx mori* L., supplementation, methionine, tryptophan, lysine

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