

Investigation on carnosine distribution of poultry tissues, antioxidative effect in tissues of rats, and β -alanine supplementation on muscle carnosine synthesis

Wan-Pin Su (5111)

2014/12/31

Outline

1. Introduction
2. Antioxidant activity of carnosine extracted from various poultry tissues
3. Effect of carnosine treatment on prooxidant–antioxidant balance in tissues of rats
4. Effect of β -alanine dosing protocols on muscle carnosine synthesis and washout
5. Conclusion

Abstract

Carnosine (β -alanyl-L-histidine) is a dipeptide with antioxidant properties, which is found in high concentrations in skeletal muscle. This report was to investigate antioxidant activity of carnosine extracted from poultry tissues, and the effect of carnosine treatment on prooxidant-antioxidant balance in liver, heart and brain tissues of male rats. In addition, the effect of β -alanine supplement on muscle carnosine synthesis and washout was reported. Results indicated that carnosine was present in all poultry tissue samples. The liver had the highest carnosine content, followed by lung. Brain had the lowest content. Except for the brain, all tissue ultrafiltrates and reconstituted dry powders showed TBA reactive species inhibition and free radical scavenging activity. The effects of carnosine treatment on lipid peroxidation and antioxidant status of liver, heart, brain in male young and aged rats were investigated. Carnosine treatment decreased high malondialdehyde, diene conjugate and protein carbonyl levels, and caused significant increases in vitamin E level and SOD activity in the liver of aged rats. Results indicated that carnosine supplementation may have protective effects on age dependent oxidative stress in liver tissue. The effect of two β -alanine dosing protocols on muscle carnosine synthesis and washout was also studied. Carnosine is found in high concentrations in skeletal muscle and chronic β -alanine supplementation can increase carnosine content. The absolute increase in muscle carnosine is only dependent upon the total β -alanine consumed and is not dependent upon baseline muscle carnosine, the muscle type, or the daily amount of supplemented β -alanine. In conclusion, the extraction of bioactive carnosine can be exploited from low economic value poultry tissues to increase the economy of the poultry industry.