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Abstract

The Impact of Marine and Leguminous Protein Hydrolysates on the Enhancement of HDL's Antioxidant Capacity in Hypercholesterolemic Rats

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Abstract

Background and Aim: This study compares chickpea and sardine protein hydrolysates in preventing HDL's antioxidant power in hypercholesterolemic rats, highlighting the broader antiatherogenic role of HDL beyond cholesterol transport.

Method: For 28 days, 12 male Wistar rats (200±15g) were divided into three groups: sardine protein hydrolysate (SPH), chickpea protein hydrolysate (CPH), and control group (CG), receiving daily gavage of 1g/kg BW along with a diet comprising 20% casein, 10% sunflower oil, 1% cholesterol, and 0.5% cholic acid.

Results: In the study, APOAI and APOAIV levels in HDL were similar across treated groups and controls. LCAT activity, crucial for cholesterol reverse transport, decreased by 35% in HPS rats. CPH rats exhibited a 38% increase compared to SPH. PON1 activity was 8% and 22% higher in chickpea and sardine hydrolysate groups than in CG. LDL oxidation, measured with DCF, was least in HPC (-31%) and SPH (-18%) compared to controls. Incubating LDL with HDL reduced oxidation by -32%, -35%, and -73% in CG, SPH, and CPH groups. Chickpea hydrolysate showed superior antioxidant activity, reducing oxidation by 64% and 72% compared to HPS and controls. All groups demonstrated antioxidant HDL capacity (IOH < 1), with no significant difference between SPH and controls. Chickpea hydrolysate increased HDL antioxidant capacity by +58% and +60% compared to sardine hydrolysate and controls, respectively.

Conclusion: In conclusion, sardine and particularly chickpea protein hydrolysates show promise as effective natural bioactive compounds in preventing hypercholesterolemia by enhancing HDL's antioxidant capacity in rats.

Keywords: *Rat, Sardine, Chickpeas, Proteins hydrolysates, HDL, Antioxidant capacity*

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