多頻超音波解凍對水產品蛋白質結構及品質之影響

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摘要

超音波輔助解凍是近年來新興的解凍方法，其空化現象 (cavitation) 產生的氣泡在爆裂時會產生高熱量，進而提高解凍速率，且不易有微波解凍、高壓靜電場解凍等局部過熱的缺點。目前超音波解凍較多使用單頻、多功率的陸畜肉研究，對於水產品的探討較少，因此本研究整理了單頻、多功率白犛牛及多頻超音波水產品解凍，同時與傳統解凍進行比較，並觀察水產品的肌原纖維蛋白質結構、保水力及品質的改變。結果顯示，使用 600W 的白犛牛解凍最快，但 400W 解凍後的品質則最佳。多頻超音波顯著縮短了水產品冷凍樣品的解凍時間，同時也保留了更佳的品質。經過超音波解凍處理後的樣品具更好的紋理特徵、較低的 TVB-N、pH 值及 TBARS 值。使用雙頻、三頻超音波處理的二級和三級結構更加穩定、TPA 結果與新鮮樣品最相近，其中雙頻超音波更具有較佳的保水力。綜上所述，更高的功率雖然可以提高解凍速率，但品質不見得較佳；多頻超音波可以減少解凍對肌原纖維蛋白質的損害，更好地保持魚體蛋白質的穩定性，使其與新鮮樣品相似。但在不同功率跟頻率的組合下可能會影響超音波的空化現象，因此未來可進一步探討功率和頻率的組合對水產品的品質影響。

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