

(学会誌等への発表論文)

## スルメイカ外套膜筋の加熱ゲル形成に及ぼす グルコン酸ナトリウムの影響

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グルコン酸ナトリウム (グルコン酸Na) が, イカ肉から調製した加熱ゲルに及ぼす影響を明らかにするため, 食塩およびソルビトールの場合と比較検討した。90℃直接加熱ゲルおよび予備加熱後90℃加熱した二段加熱ゲルの破断強度は, グルコン酸Naを添加したゲルが, 最も高い値を示した。しかし, いずれのゲルにおいてもミオシン重鎖 (HC) の多量化は確認されず, HC残存量と破断強度には正の相関が認められた。グルコン酸Na添加ゲルでは, 自己消化が

抑制されHC含量は高く, そのため, ゲル物性は向上することが明らかとなった。

キーワード: スルメイカ, ゲル形成 (ゲルケイセイ), グルコン酸ナトリウム, 自己消化 (ジコショウカ), 塩溶解性 (エンヨウカイセイ)

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## Seasonal variation in docosahexaenoic acid content in horse mackerel caught in the East China Sea

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Hiroaki Saito, and Yukinori Nozaki

The fatty acid composition in horse mackerel caught off Nagasaki, off Tsushima Island, and in the middle of the East China Sea was investigated. The ratios of monoenoic and polyenoic acids to the total fatty acids in the Nagasaki and bull trawl catch specimens showed a negative correlation. The DHA (22:6n-3) ratios of total fatty acids in summer-caught specimens were apparently lower than those in winter-caught specimens, and this tendency was significantly clearer in smaller sized fish, while DHA actual levels in tissues varied little throughout the year. Consistently high levels of DHA were found in various fishing areas, which suggests that horse mackerel offers a stable source of DHA.

**Key words:** DHA, East China Sea, fatty acid composition, horse mackerel, monoenoic fatty acids, polyenoic fatty acids, saturated fatty acids

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# Seasonal variations in gel- forming ability of rabbit fish

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We studied the potential utilization of rabbit fish (*Siganus fuscescens*) meat in textured products. We examined the gel-forming ability of rabbit fish caught between July 2001 and August 2002 off the coast of Nagasaki. Fish obtained from approximately July to September (during the spawning season and immediately after), had low gel-forming ability. Fish caught in winter or spring showed high elastic gel formation. Washing of meat with fresh water was found important for gel formation. It was concluded that rabbit fish meat has a high gel-forming ability, and, therefore, that rabbit fish meat is suitable for textured food production except spawning season.

**Key words:** gel- forming ability, rabbit fish, seasonal variations, spawning season

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# Effect of starvation on lipid metabolism and stability of docosahexaenoic acid (DHA) contents in horse mackerel *Trachurus japonicus* tissues

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In order to characterize starvation effect on 22:6 n-3 (docosahexaenoic acid, DHA) in marine fish tissues, horse mackerels *Trachurus japonicus* were reared in tank with filtered sterilized seawater under non-feeding condition for 107 days. The crude total lipids (TL) of ordinary dorsal muscle, dorsal skin, and viscera of the starved individuals were separated into classes on silicic acid columns, and the constituents of the crude total lipids (TL) were quantified by gravimetric recovery from column chromatography. The total lipids (TL), initially >85% triacylglycerols (TAG) in dorsal muscle, and even more in skin lipids, decreased dramatically within the first 44 days of starvation, and then gradually decreased during the remainder of the test period, while the visceral TL decreased more slowly. The percentages of both saturated and monoenoic fatty acids in the muscle TL were somewhat decreased, but those of DHA increased significantly in that tissue during the test periods. Decreases took place in both phosphatidylethanolamine (PE) and phosphatidylcholine (PC), initially much less than TAG, but both maintained characteristically high levels of DHA during starvation.

These findings provide evidence that all of the fatty acids in the depot lipids of the fish tissues are easily metabolized for energy production during starvation, but DHA in the starved fish muscle lipids was maintained at a consistently high level, revealing that starvation did not have an effect on DHA stability in phospholipids. The findings suggest that preservation of DHA in cell membrane lipid PE and PC is necessary for self-protection functions in starving fish.

**Key words:** starvation, DHA, horse mackerel, phosphatidylcholine, phosphatidylethanolamine, triacylglycerols

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