魚肉中のプロビタミンD3含有量

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Short Paper

Provitamin D_3 Contents in Fish Meat

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Fish meat has a relatively higher content of provitamin D_3[1,2]. But provitamin D_3[7-dehydrocholesterol], a precursor of vitamin D_3 which plays an important role in the formation of mammalian bone, does not serve as vitamin D_3[3], because provitamin D_3 is not converted into vitamin D_3 *in vivo* without UV irradiation through the skin. Recently, to utilize provitamin D_3 in fish meat as a source of vitamin D_3 efficiently, provitamin D_3 was converted into vitamin D_3 by UV irradiation *in vitro*.[4] In this study, we examined about provitamin D_3 content in the meat of different fishes to select suitable fish species for this purpose.

Provitamin D_3 was determined according to the modified procedure of Suzuki's method.[5] Lipid was extracted from 25 g of fish meat with chloroform-methanol (2: 1) and saponified by stirring in KOH-ethanol under N_2 gas at a room temperature for 90 min. The unsaponified lipid was extracted with *n*-hexane, washed with distilled water, and dehydrated with Na_2SO_4. The *n*-hexane extract was then evaporated to dryness *in vacuo* below 40°C, and the residue was dissolved in 1 m*l* of ethanol. A 20 μl aliquot of ethanol solution was subjected to HPLC analysis with a Jasco Intelligent HPLC 880-Pump equipped with a Jasco Finepack SIL C18 T-5 column (ϕ 4.6 mm×250 mm) and a Jasco Intelligent UV/VIS Deterctor 870-UV. The conditions of operation were as follows: mobile phase, acetonitrile-methanol (39: 1); flow rate, 1 m*l*/min; column temperature, room temperature; wavelength, 265 nm. The recovery of authentic provitamin D_3 (Aldrich Chemical Co.) was 77.8 to 80.2%.

The examination with various kinds of fish suggested that provitamin D_3 was contained to a higher degree in small-sized fish than in large sized fish. Therefore, we examined whether or not the provitamin D_3 content varied with fish size, using three species as samples. The red sea bream (*Pagrus major*), the flatfish (*Paralichthys olivaceus*), and the sweetfish (*Plecoglossus altivelis*) were obtained from the culture ponds in Ehime, Chiba, and Nagano, respectively.

As shown in **Fig. 1.**, the smaller the fish, the higher

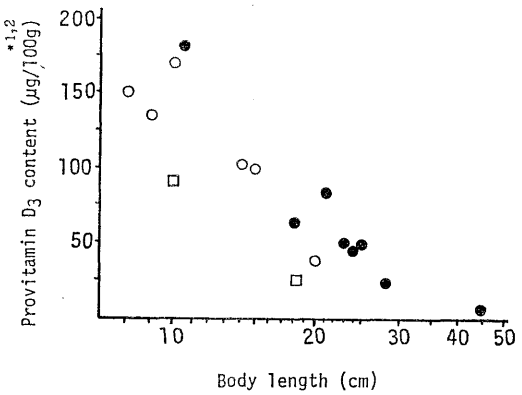

Fig. 1. Relationship between provitamin D_3 content and body length of fish

●, Flatfish; ○, Sweetfish; □, Red sea bream

*1 The meat of 1–12 sample fish was homogenized and applied for the measurements.

*2 Each value is the average of 2–4 measurements.

was the provitamin D_3 content in every fish species. From these findings, it is concluded that the provitamin D_3 content in fish meat is more strongly reflected by fish size, namely the growing stage, rather than by species difference. Accordingly, the contents of provitamin D_3 in fishes should be always discussed along with the size. The reason for the higher content of Provitamin D_3 in the young fish is not known.

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