



**Issue 7: June, 2013:** This e-bulletin is aimed at personnel in fisheries & aquaculture, at fish packers, processors, distributors, retailers, and finally consumers.

## **Survey on the oil content of three fish species**

Fifty six percent of consumers in a recent Dublin survey (see next issue, No.8, of SeaHealth-ucd) said they bought fish for health reasons and when asked is fish good for health 100% of the 300 consumers surveyed said yes. When asked why fish is good for health 53% responded 'fish oil' indicating reasonably good awareness of the fish oil good-for-health message. In view of this a mini survey was conducted in the UCD Institute of Food and Health on the oil content of farmed salmon, mackerel, and farmed sea bass portions obtained from a major retail outlet in Dublin in the period November-March 2012-2013. These are three popular species with the first two being recognised by many consumers as good sources of fish oil. Farmed sea bass is a more recent arrival but is commanding considerable shelf space in-store.

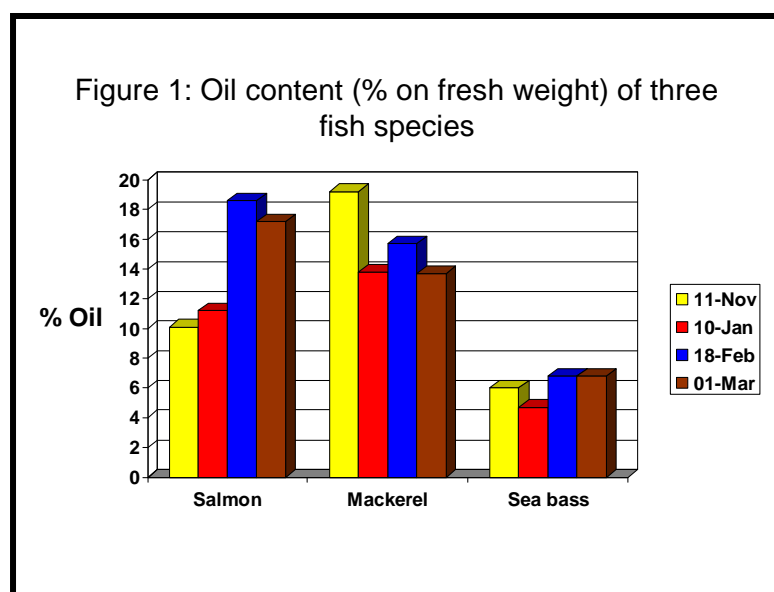
### **Procedure**

Three fillets/darnes each of farmed salmon, mackerel and farmed sea bass were obtained from the ice counter of a major retail store in Dublin on 11 November, 10 January, 18 February and 1 March 2012/2013. Samples were freeze-dried and tested for oil, moisture and protein content. Trial design was 3 species x 4 test dates x by 3 replicates (36 samples overall). The samples obtained were equivalent to those being purchased by consumers in that store on the days of the tests.

### **Oil content of the samples**

It is desirable that the oil content of oily fish be above 10% as this ensures a reasonable oil intake by consumers eating the fish. In the current trial there was a difference in oil content between species and between test dates but the oil content of salmon and mackerel was 10% or above throughout the tests. Values for salmon varied considerably being 10-11% on the first two test dates but 17-18.5% on dates 3 and 4 (Fig. 1). The latter two figures represent the top end of the oil scale for farmed salmon. Mackerel on the first test date had an oil content of circa 19% while values on dates 2-4 were in the range 14-16%. These data show a satisfactory situation with respect to oil content. The oil content of farmed sea bass was

much lower than the other two species at circa 4-6% (Fig. 1). This was unexpected as a Greek study (Zotos & Vouzanidou, 2012) indicated an oil content range of 8.1-14.3% in farmed sea bass. The lower value in the current study may be due to the feeding regime of the farmed fish. It should also be stressed that a high oil content in farmed fish does not necessarily reflect a high content of EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) as their content depends on the amount of marine oil in the fish feed. However, in wild fish such as mackerel, high flesh oil content ensures a good content of EPA and DHA as the diet of wild oily fish is mostly small oil-containing fish.



## Oil trades with water

The sum of oil and water contents of oily fish is circa 80% and high oil content means a lower water content and vice-versa. This is important for consumers as they don't want to spend money on oily fish with low oil content as in effect they are paying for water rather than oil. This inverse relationship was highlighted in the current study with a rank correlation coefficient of -0.93 between oil and moisture contents (12 data points; 3 species x 4 test dates). Mean oil plus moisture content (over three species) in the current study was 80.1%.

### Reference

Zotos & Vouzanidou. 2012. *Food Science and Technology International*, 18(2), 139-149

This study was conducted by Clodagh Slattery and Professor Ronan Gormley of the UCD Institute of Food and Health, Belfield, Dublin 4. More information from [ronan.gormley@ucd.ie](mailto:ronan.gormley@ucd.ie)

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