



Issue 20: April 2016: This e-bulletin is aimed at personnel in fisheries & aquaculture, at fish packers, processors, distributors, retailers, health professionals and finally consumers

Boarfish update from UCD

Tests on boarfish (*Capros aper*) in the UCD Institute of Food and Health (UCD-IFH) in 2015 showed that boarfish mince gave strong gels indicating good water binding properties and potential for a range of fish products (Cunningham & Gormley, 2015). Studies on the gel strength of boarfish mince and surimi were continued in 2016 (Trials 1-3) and the composition of boarfish caught on six different dates was also compared (Trial 4).

Effect of long-term storage at -20°C on boarfish gel strength

Tests were conducted in December 2015 on boarfish samples (whole fish) stored at -20°C for 0.75, 1, 10, 12, and 36 months (Trial 1). It is important to stress that this was not one bulk sample tested after different storage periods i.e. each sample was a different batch/catch of boarfish. Full strength and added water boarfish gel cylinders (4cm high; 3cm diameter) were made from mince by the procedure of Cunningham & Gormley (2015) and were compressed (Instron Universal Testing Machine) individually by 1cm between two flat plates. Gels made from boarfish from the different storage periods all had force (compression) values >20N indicating good compressive strength. Values for added water (15%) gels were >13N. This shows that boarfish have good long-term storage potential at -20°C and gel properties were only minimally affected by deleterious factors during frozen storage (Gormley et al., 2002). However, oxidation could be a problem in the long term frozen storage of boarfish and may warrant a further study.

Storing boarfish as frozen whole fish versus frozen mince

Trial 2 compared gel compression (force) values for mince from intact boarfish stored at -20°C for 3 years versus boarfish gels made from mince stored at -20°C for 3 years. Compression values for gels from fish stored whole were 19.9 (full strength) and 17.4N (15% added water) versus 8.8 (full strength) and 4.9N (15% added water) for gels from fish stored as frozen mince. These data mirror results of research on the species silver smelt by Gormley et al., (1993) which confirmed that it is better to store whole frozen fish and then mince when required rather than store frozen mince.

Preparation & characterisation of boarfish surimi

Surimi was prepared on a laboratory scale from boarfish mince blocks stored at -20°C for three years. Mince (500g) was thawed overnight (2-4°C) and was washed and dewatered (coffee flask & plunger) three times resulting in a surimi weight of 370g (26% loss from original mince). Surimi gels had a compression value of 18.8 compared with 8.8N for gels from mince that was used to make the surimi. Composition values (%) for the surimi and mince were: moisture (81.1 vs 72.7), protein (14.0 vs 15.2), oil (3.79 vs 7.27) and ash (0.47 vs 1.08). White/yellow colour ratio (Minolta meter) values were 36.1 (surimi) and 7.5 (mince) indicating that brown colour had been removed from the surimi by washing. The surimi had an attractive light pink colour (presumably due to haem pigments) and could be readily moulded and shaped suggesting potential for making seafood product analogues.

Composition of boarfish caught on different dates

Samples of boarfish caught on 6, 7, 11 November and 2, 3, 6 December 2015 were tested for moisture, protein oil and ash contents. There was no difference in composition of fish from the different dates and grand mean values were 73.3 (moisture), 18.2 (protein), 5.85 (oil) and 3.6% (ash). This result was largely as expected as the catch dates spanned a period of only 4 weeks and as such the boarfish would be expected to be similar in stage of maturity. The mean ash content of 3.6% was high but this was because the samples tested were bone-in.

Conclusions

Boarfish mince produced strong gels indicating that boarfish is a robust species in terms of freezing and frozen storage. Boarfish surimi produced in the laboratory had an attractive light pink colour and gave strong gels. There was no difference in composition values (bone-in; skin-on samples) for six boarfish batches caught in a 4 week period in November-December 2016.

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References

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