Application Report

Texture Testing of Salmon Fillets

INSTRON®

General

Salmon fillets can exhibit different textures that are generally associated with subjective quality measures. The objective of this test was to make quantitative measurements to determine the texture - and hence quality - of salmon fillets.

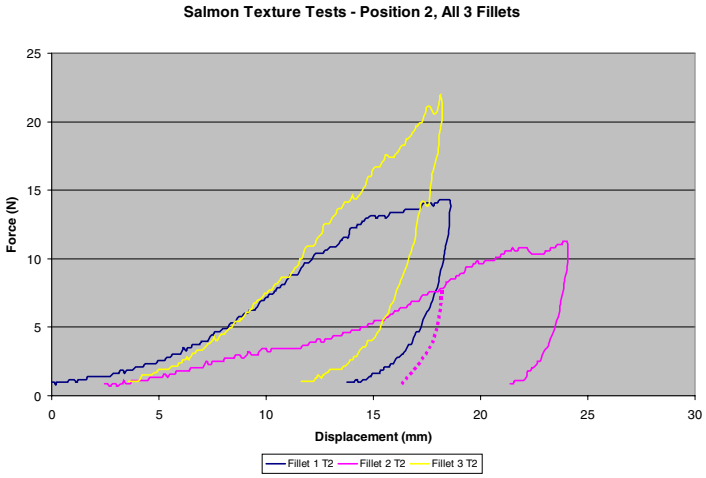
Sample Preparation

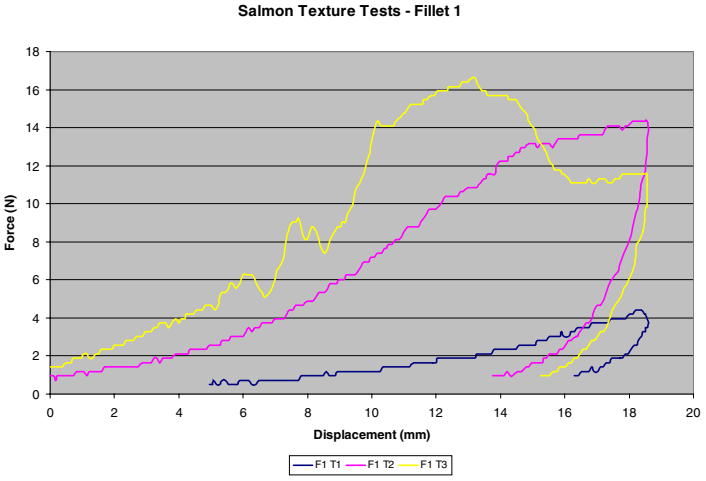
Three fillets were prepared, each from a different quality grade, as determined subjectively. The goal of the testing was to see if texture testing would produce measurable differences.

Texture Testing

Each of the three fillets was indented by means of an In-Spec 2200 Hand-Held Mechanical Tester equipped with a 1" (25mm) diameter plunger, as shown in the photograph. Two "stand-off" legs" were used to brace the instrument against the table. Due to fixed leg separation, the stand-offs were simply pressed into the fillets at the desired test locations. The plunger was extended into the fillet at a rate of approximately 0.2in/min (5mm/min). Test conditions were performed for demonstration purposes only.

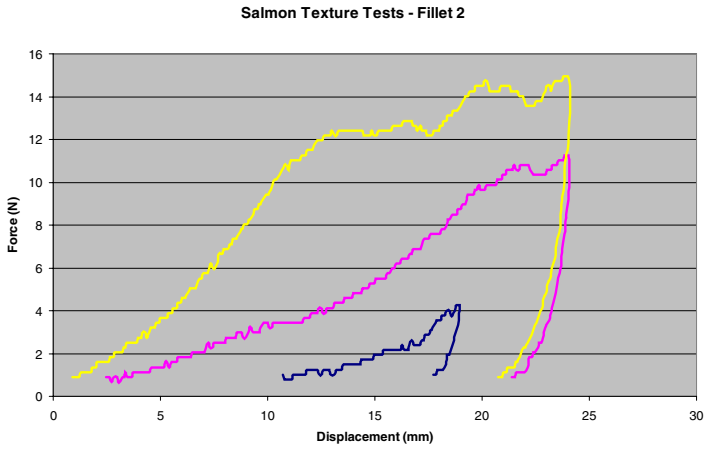
Each fillet was indented 3 times; the first near the tip of the fillet (at the thickest point), and the following two at roughly one inch separations along the length of the fillet, also at the thickest points.

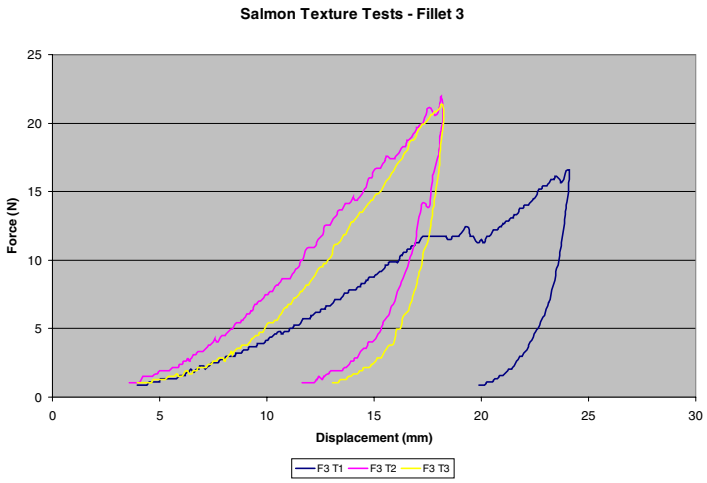




Results

It can be seen that the first test in each series caused the meat to flow away from the indenter, thus providing low maximum forces. The second test in each fillet, however, presented a region with more bulk constraint, and thus more representative curves. The first graph shows the results of test #2 on each of the three fillets. The following 3 graphs show the results on each individual fillet. Clearly there is a difference in texture that is revealed by test number 2. Note that some of the curves show a degree of "stepping"; these result from the 12 bit resolution of the data acquisition and point to the need for a smaller, higher resolution load cell for these tests – one on the order of 10 lbs full scale.The dotted line on the 3-fillet graph shows the where the unloading curve for fillet number 2 would have been if it had been indented to the same depth as the other two.





Conclusion

Indentation tests on salmon fillets with an In-Spec 2200 Hand-Held instrument can reveal significant differences in texture and allow grade separation, provided the tests are performed at the same location on each fillet. Further work is recommended in order to refine the technique.

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