General

The content of this brochure is based on results from the Nordic project ***"SALMON QUALITY; Quality parameters for salmon"***. The project covered sampling techniques and methods applied in the salmon industry to determine the quality of fresh Atlantic salmon *(Salmo salar)*. The difference in the quality parameters of Atlantic salmon fillets of different origin and the distribution of each quality parameter within each fillet was studied. The main quality parameters studied were; fat content, composition and distribution of the fat in the fillet; colour intensity and distribution of the colour in the fillet, and texture. Salmon from Iceland, Faraoe Island and Norway was used in the project.

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Matra, Technological Institute of Iceland, Iceland, co-ordinator of the project
Institute of Marine Research, Bergen, Norway
Institute of Nutrition, **Directorate of Fisheries**, Bergen, Norway
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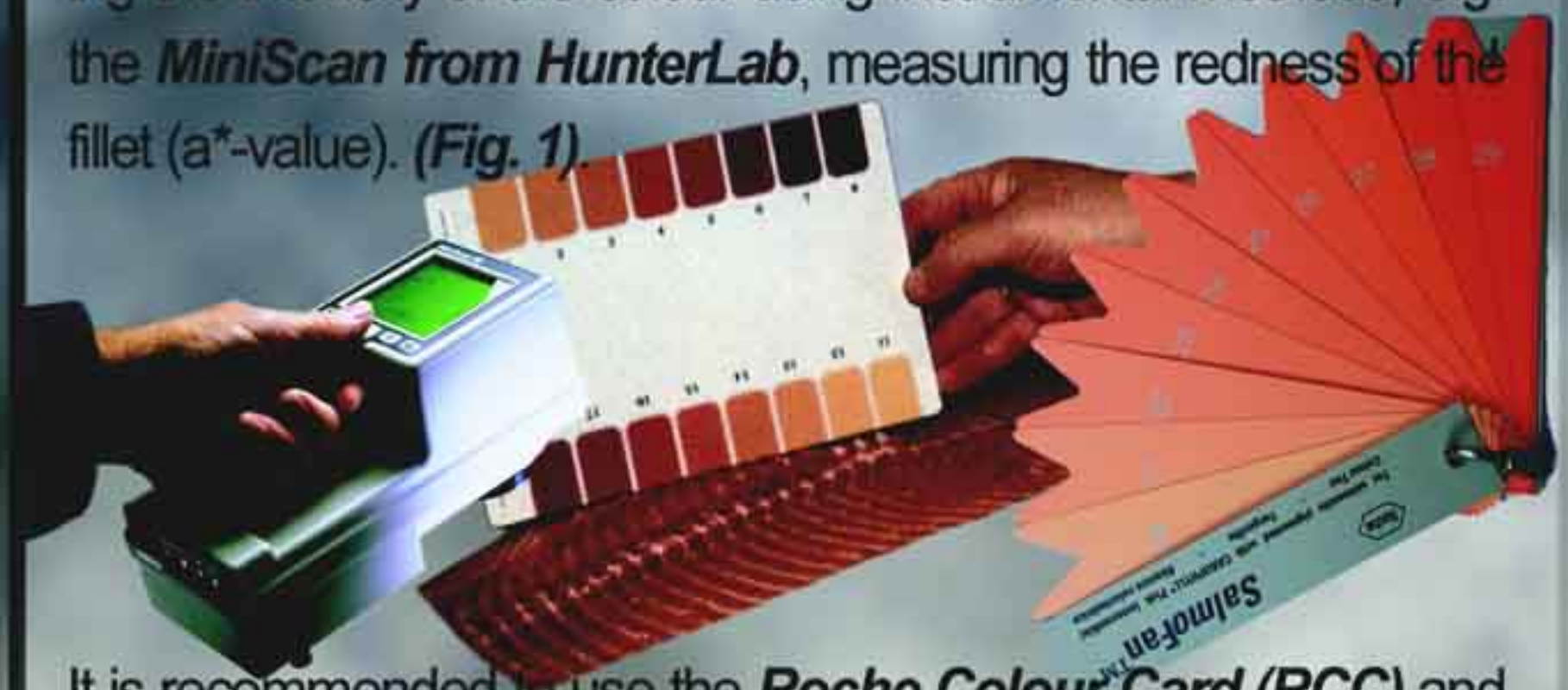
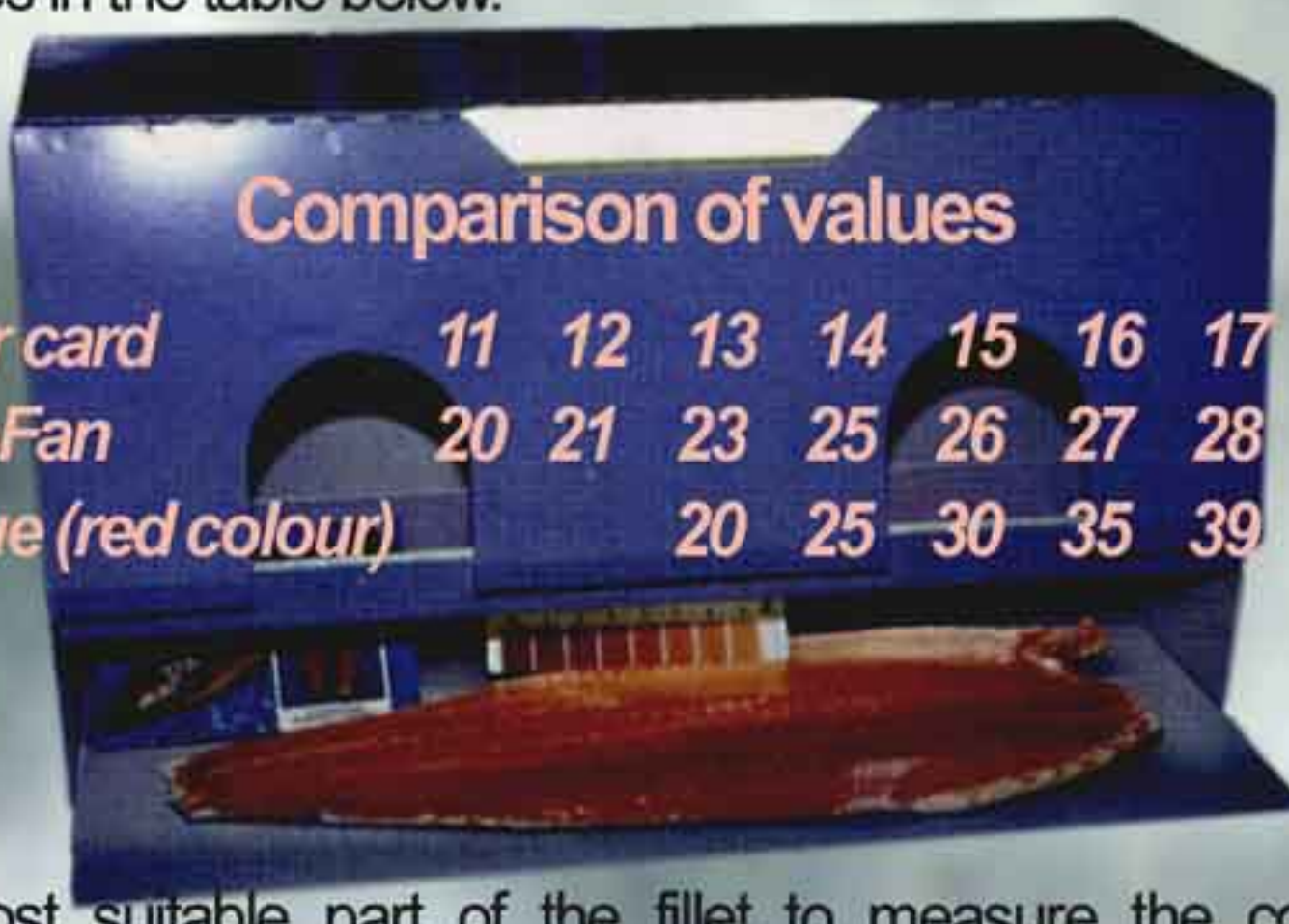
Colour

The colour intensity in salmon fillets can be measured by chemical methods and non-destructive methods. Chemical extraction and high performance liquid chrom-atography ***(HPLC)*** method is commonly used to determine the pigment astaxantin/cantaxantin content of the flesh. Two non-destructive methods are used to estimate the colour appearance. One is based on comparing the fillets to ***Roche Colour Card (RCC)*** and ***Roche Colour Fan (RCF)***. The other is based on measuring the intensity of the colour using instrumental methods, e.g. the ***MiniScan from HunterLab***, measuring the redness of the fillet (a*-value). ***(Fig. 1)***.



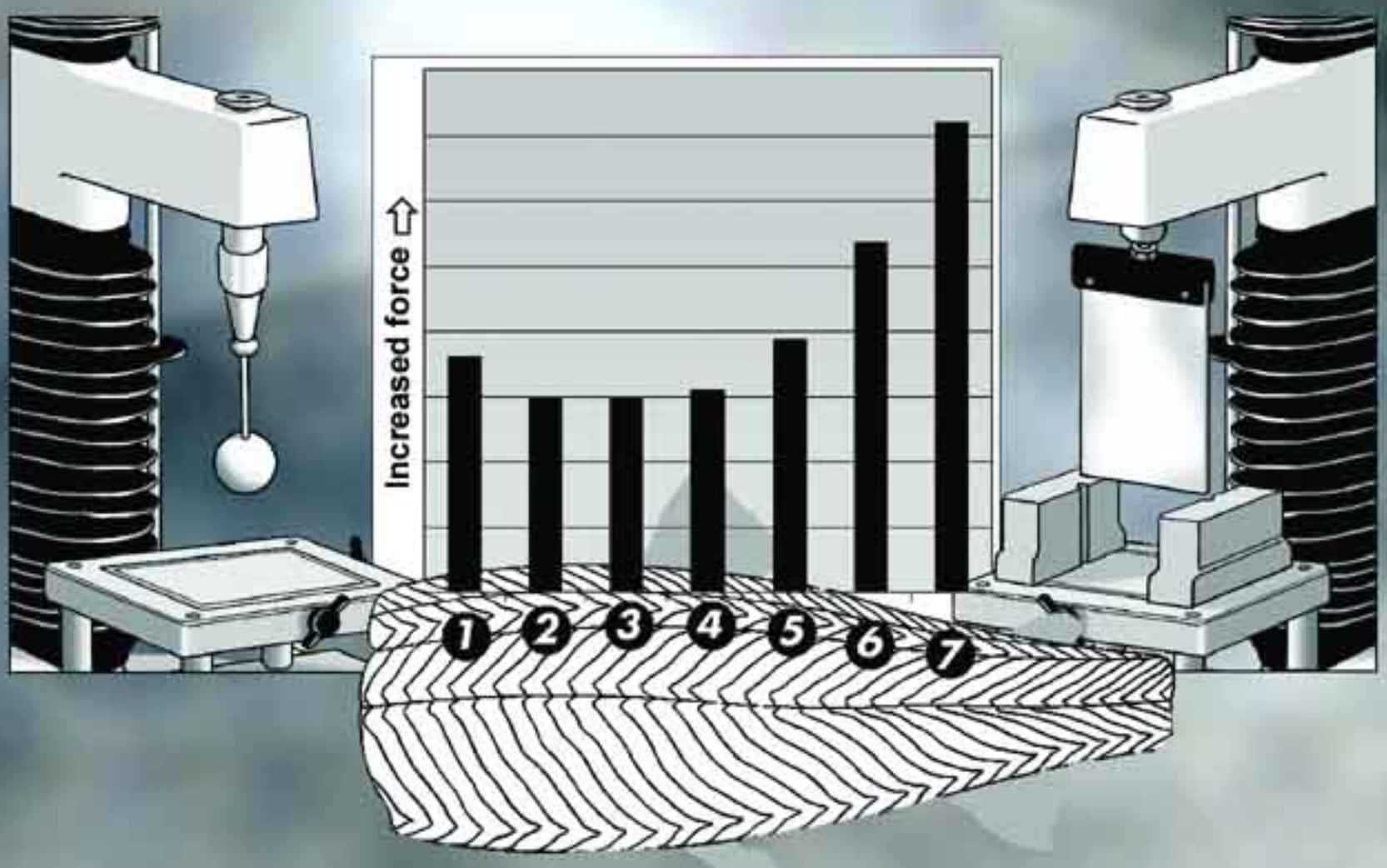
It is recommended to use the ***Roche Colour Card (RCC)*** and ***Roche Colour Fan (RFC)*** under controlled conditions in a marine colour control box ***(Fig. 2)*** and compare the scores to a*-values in the table below.



The most suitable part of the fillet to measure the colour appearance is the location between the dorsal fin and the gut-opening on the dorsal site ***(Fig 3)***.

Texture

Textural properties vary along the salmon fillet ***(Fig. 9)*** and can be measured with the ***Texture analyser XT.RA*** (Stable Micro System, England).



The method used can be based on puncture using spherical probe measuring the hardness of the fillet, and cutting the fillet with a blade measuring the shear force.

The former is a non-destructive method and simulates the *"finger method"* applied in the salmon industry and the latter is a destructive method.

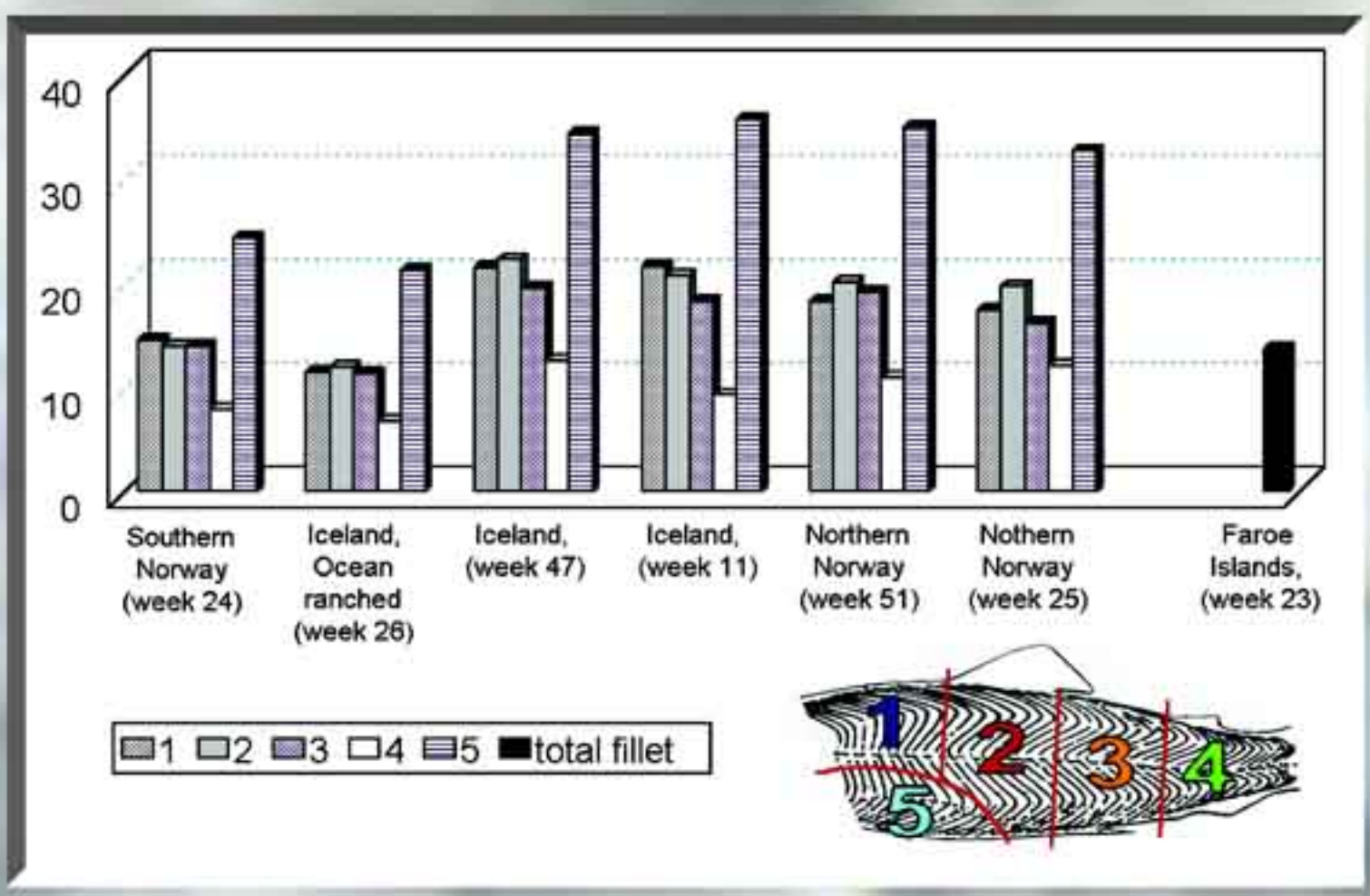
The part of the fillet below the dorsal fin *(Location 3 and 4)* represent the mean value for estimating the textural properties in the whole fillet, and is recommended ***(Fig.10)***.

Fat content can be measured by both destructive and non-destructive methods. Several destructive chemical extraction methods can be applied.

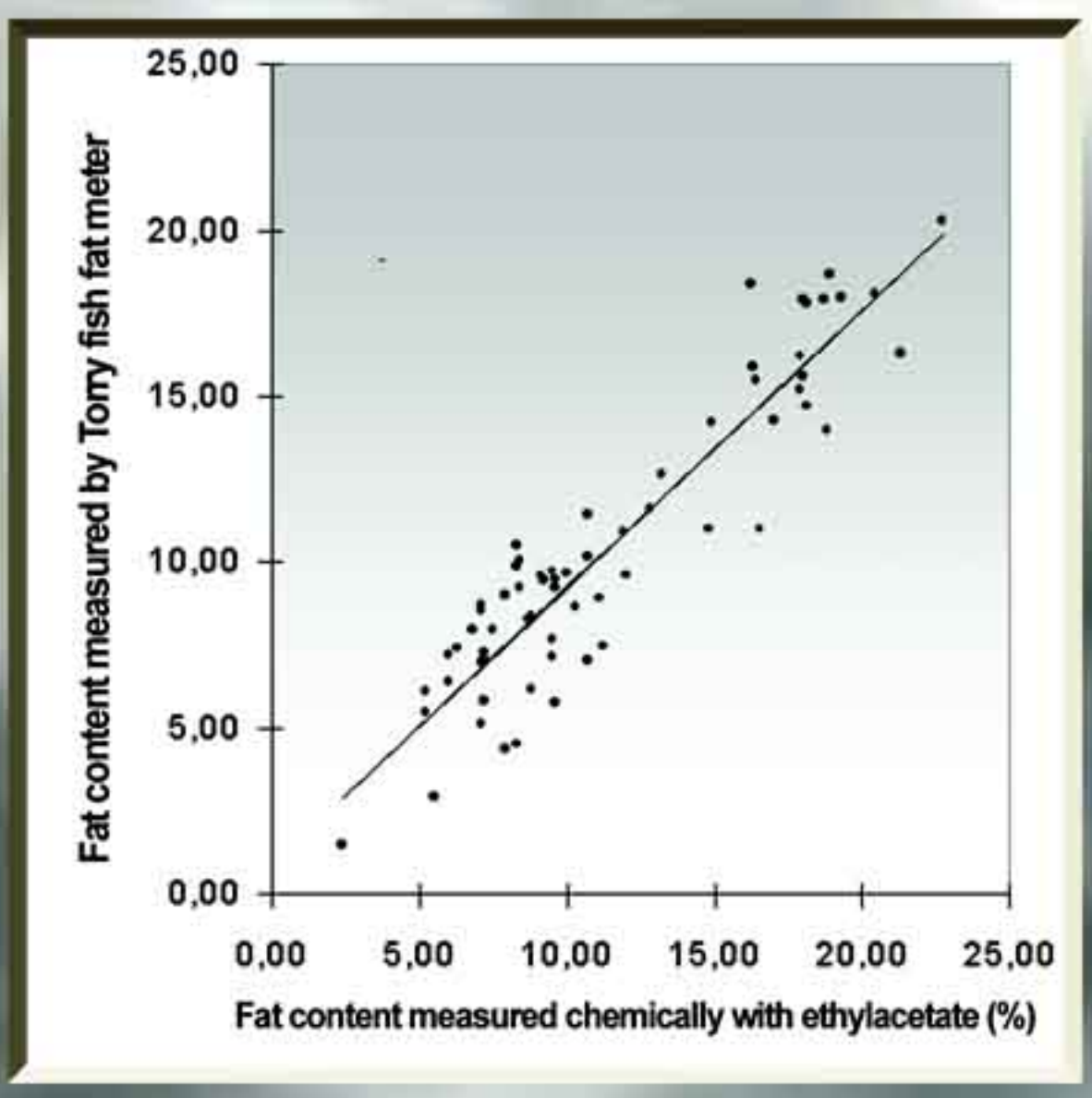
For example chemical extraction with ethyl acetate according to the NQC (Norwegian Quality Cut, Norwegian Standardisation, NS 9402) ***(Fig. 4)***.

The non-destructive methods available are for example the Torry Fish Fat meter ***(Fig. 5)***.

The fat content in salmon fillets variates along the fillet and a typical distribution of fat content is shown in ***Fig. 6***, measured with chemical extraction using ethyl acetate.



The non-destructive method by using Torry Fish Fat meter showed a good correlation with the chemical extraction method (R = 0,85) ***(Fig. 7)***. Thus the Torry fat meter can give a reliable estimate of the fat content on a production batch.



The part of the fillet between the dorsal fin and the cut opening (NQC) ***(Fig. 8)*** represents the mean fat contents in the salmon fillet and is recommended as a sample for fat content measurements.