

Fishery Leaflet 209

Chicago 54, Ill.

December 1946

CERTAIN ASPECTS OF THE GERMAN FISHING INDUSTRY

REPORT IV - THE PRESERVATION OF FISH BY CANNING AND RELATED PROCESSES

One of a series of six fishery leaflets* abstracted from BIOS FINAL REPORT No. 493, Item No. 22 prepared by Mr. W. H. Myles, Ministry of Fisheries, Dr. G. A. Reay, Department of Scientific and Industrial Research, and Lt. H. W. M. Farrer, Herring Industry Board, for the British Intelligence Objectives Sub-Committee, 32 Bryanstone Square, London, W. 1.

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Sources of Information

Miscellaneous information in this field was gathered from visits to various processing establishments, viz.

G.F.G., Hohenzollern Ring, 233, Hamburg (Hugo Haberle, Manager).
KAHLER, Bruderstrasse 8/12, Hamburg. (Heinz Schroder, ").
NORDLAND (H. GUNKEL), Kiel-Hassee, Kiel (Conrad Weber, ").
The NORDSEE Distributive concern at Wesermunde.
DR. LUCKE of the Institut fur Fischverwertung, Wesermunde, also contributed some information.

*F.L. 206 Fish Processing Machinery, F.L. 207 Quick Freezing and Cold Storage of Fish, F.L. 208 Smoke Curing of Fish, F.L. 209 The Preservation of Fish by Canning and Related Processes, F.L. 210 "WIKING TWITISS" (A Protein Product Manufactured from Fish), and F.L. 211 Institute for the Utilization of Fish of the Federal Fisheries Agency. (Artificial Ice, Spoilage in Fish, Anti-Oxidants, and Fish Meal & Oil Manufacture).

General

The Germans differentiate between 'conserves' and 'preserves'. The term "conserve" is applied to products which in the process of canning have been rendered sterile, whereas "preserves" are products which have not been rendered sterile and which therefore must be consumed within a comparatively short time after preparation.

At the time of our visit trawler fishing on the herring ground at the Fladden was only beginning, and indeed we witnessed the arrival of the first catch at Hamburg since the war. Supplies of the raw material were therefore extremely limited in the processing establishments which we visited.

In Germany herrings are dealt with in a far greater variety of ways than in the United Kingdom, and the Germans have a fund of recipes and procedures in the general field of fish preservation that would no doubt repay study. In this connection attention may be drawn to the following books mentioned in the list obtained from the Central Fisheries Office, Hamburg, and appended to these Reports:-

- Hillmer, Carl Otto - Die deutsche Fischvollkonserven industrie, (H.A. Keune-Verlag, Hamburg).
- Jacobsen, Eduard - Handbuch fur die Konserven industrie, Konservenfabriken und den Konserven - Grossbetrieb. (Bd. I und II) (Paul Parey, Berlin, 1936).
- Lucke, Fritz - Fischindustrielle Taschenbuch, Praxis und Wissenschaft der Seefischverarbeitung. (3 Auflage) (Sergel und Hempel, Braunschweig, 1940).
- Forschungsinstitut fur die Fischindustrie - Der Fisch Bd. I und II (Lubeck 1922). (contains many recipes).

Main Cures

Bucklinge--The making of Bucklinge was witnessed and has been described in Report III (q.v.). The best herrings are chosen for the preparation of Bucklinge and the poorer quality for the production of Marinaden.

Marinaden--In the factory of G. F. G. which may be taken as typical, part of the premises were specially laid out for the production of Marinaden. The fish passed from the unloading bank to a battery of boning machines (Nordischer Maschinenbau) which were cleared by two belts at different levels. One carried forward the boned herring and the other the offal to the offal chute where it was loaded into vehicles. The fillets were carried to rotatory machines of usual type in which they were washed and scaled. The fillets were thereafter pickled in large tanks for 6 days in a mixture of 5 to 6 per cent acetic acid and 6 per cent salt. There were 80 of these pickling tanks in one room each holding 1,000 kg. of fish and 1,000 kg. of vinegar pickle. The pickle was fed to the vats from mixing tanks above through porcelain pipes. The atmosphere of the whole room was controlled by heating or cooling as required in summer and winter

respectively at 10 to 15°C. After pickling the fillets were packed in barrels containing 100 kg. of fish and 25 kg. of vinegar pickle i.e. a mixture of 1 per cent acetic acid and 4 per cent salt. The storage life of the product was given as 4 to 6 weeks at ordinary temperatures.

Brat Herrings--The preparation of this product was not seen but was described by Kahler as follows. The fresh herring were washed, headed and gutted, then rolled in dry flour and laid on perforated aluminium trays which were stacked on to a continuous moving belt which carried the trays through and immersed them in heated oil (180°C.) for 4 to 8 minutes depending on the size of the fish. Soya oil is commonly used for frying. After cooking the fish are packed with vinegar into tins and sealed.

Canned Herrings--We were told by Kahler that herrings were canned by either of the following methods. The fillets produced by the Nordischer Maschinenbau machine were either (a) laid on perforated trays, passed through boiling water and canned with sauces, e.g. tomato, mustard, white wine etc. or (b) hot smoked and dried as "kippers", as described in Report III on the Smoke Curing of Fish, and then canned with oil.

In the Nordland factory at Kiel, Sild before canning are normally cooked for 15 minutes in a steamer cabinet in live steam, laid out on trays carried on trolleys. Thereafter the trays of fish are taken by moving belt through a tunnel about 40 feet long by 6 feet square cross sections. At the inlet end a small fire box heated the air with the introduction of a little smoke, whilst at the top of the outlet end there was a chimney to create draught. The time of travel was 15 to 20 minutes and the temperature on the average was said to be 50° to 60°C. Thereafter the fish were packed in cans with oil or sauce, closed and sterilised in the usual way.

It was noted that lacquered aluminium cans were much in use mainly it was said, for oily or non-acid packs. Owing to the great ductility of aluminium, special care was required in pressure cooling. Nordland of Kiel were seen to have installed two special horizontal pressure cooling retorts, said to be particularly satisfactory and made by Kvaerner Brug, Oslo. The type was L.W. 402.

Canned Seelachs (Coalfish)--This process was not witnessed but was described by Dr. Lucke as follows. The fish is filleted and is laid down for a week or more in large piles together with salt. The coalfish as required is taken out of the pile and is cut in lengths of about 3 in. These pieces are piled one on the top of the other about 9 in. high and put in what is to all intents and purposes a bacon slicing machine. Slices of about 1/16 in. are taken off. These are laid on trays and are then dipped in a soluble red dye of coal tar origin. They are then put into a smoke kiln and cold smoked for about 20 minutes, or they are immersed in a solution of "Smoke essence" (produced by wood distillation). The product is packed in tins with oil - either soya, sunflower or "brassica" - and the tins are sealed without sterilisation. Treatment with "Smoke essence" was regarded as a poor substitute for smoke curing, the flavour being too phenolic. Sometimes the cured Seelachs is canned as a red fish paste.

Fish Balls--According to Dr. Lucke, fish balls in mustard sauce were packed during the war from Norwegian 'stockfish'. This was hammered for some days in running water to break it up and reconstitute it. Fish roes, salted and fresh

mixed, were incorporated in the balls with the 'stockfish'. The fish balls were made for emergency feeding but were not popular. The chief area of consumption was amongst the Roman Catholic population in Southern Germany.

Fish Paste etc.--Wet salted cod or saithe, i.e. fish salted but not dried, is made into a paste and mixed with a "binder" (Dispergin) which is a lyophilic cellulose ether produced for incorporation in foods.

"Codfish in jelly" is a product made from the flesh of the cod's head mixed with gelatine.

Heavily salted milts and roes of herring are pressed through a sieve machine, the product being used in hors d'oeuvres preparations.

Salted and marinated (i.e. treated with salt and vinegar) mussels were seen in preparation at one factory. These were packed in barrels.

Recommendations

It is suggested that the British fish canning industry would benefit from a fuller study of German methods, particularly their multifarious treatment of the herring.

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