

CANNING OF SEER FISH IN OIL / TOMATO SAUCE

Aim: To study canning of seer fish fillets with and without skin in oil / Tomato Sauce

Introduction: Seer fish (*Scomberomorus* species) are highly suitable for canning because of their texture, taste and fat content. Individual fish in commercial catches may vary in size from half kg to 4 kg or more. Smaller fish are suitable for canning as steaks and the larger ones as fillets. Canners should be careful to select fish having no off odour.

Forms of Pack:

Seer fish may be canned in three forms, namely (1) Steaks, which are transverse cuts of dressed fish with skin and bone, (2) Fillets with skin, which are quarter fillets from which all bones have been removed but skin is left over, and (3) skinless fillets, which do not contain either skin or bone. For the last type, the skin of the fish can be removed more conveniently by the ‘**Lye-peeling**’ method, which gives higher yield and better appearance than the manual method-using knife.

Filling Media:

The fish may be canned in (1) brine (2% table salt solution), or (2) double refined vegetable oil (such as groundnut oil or cottonseed oil), or (3) tomato sauce (either readymade canned tomato sauce or prepared in the cannery).

Containers:

Round, sanitary containers, such as No.1 Tall can (301 x 409) or 8.0z can (301 x 206), may be used for steaks as well as fillets. Rectangular (Quarter Dingley) cans are suitable only for fillets. Plain tin cans have a tendency for sulphide discolouration, and therefore cans with internal coating of sulphur resistant lacquer (S-R lacquer) have to be used, as in the case of all sea foods.

Procedure:

The canning procedure consists of the following steps,

- 1) **Raw Material:** Select good quality fish with no stale odour, wash, weigh and keep in crushed ice.

- 2) **Dressing:** Dress the fish by cutting off head, removing gills, guts, fins and tail
 - a) Cut the dressed fish transversely to obtain steaks of required length for packing.
 - b) If fillets with skin are required, first make half fillets by slitting each fish longitudinally, starting from the tail end. Again cut along the lateral line to obtain quarter fillets. Remove all bones and dark meat at the edges. These may be cut transversely to required length for packing.
 - c) For making skinless fillets, the dressed fish may be first cut to shorter steaks. These are dipped in boiling hot, 2% caustic soda solution for 2 min. for skin removal. Immediately the pieces are washed in running water for 15 min. and the given a dip in 0.2% solution of citric acid at room temperature. Now fillets of suitable length are made from these pieces.

- 3) **Size Cutting:** Suitable lengths of pieces for packing in the three can sizes are as follows:

No.1 Tall can : 10.5cm

8-Oz. can : 5.4 cm

Quarter Dingley can : 9.5cm

Brining: The cut pieces are washed in running water to remove blood etc., and then dipped in saturated common salt solution at room temperature, brining times are 30' for steaks 20' for fillets with skin and 15' for skinless fillets. After brining, the pieces may be given a quick surface wash in fresh water.

- 4) **Packing:** Pack the fish pieces vertically in round cans and horizontally in Quarter Dingley can, in such a way that skin portion is in contact with the can. Attention to good appearance should be given in packing. Pack weights recommended are;

No. 1 tall cans - 420 g

8-Oz. can - 210g

Quarter Dingley can - 106 g.

- 5) **Precooking and Draining:** The filled cans are to be precooked in steam at 100⁰C for period ranging from 30 to 45min. depending on can size. After the cook, drain the cook juice / exudates by inverting the cans, taking care not to allow the fish to drop out.

6) **Filling with Liquid Medium:** Fill the cans with hot (80-90⁰C) brine (table salt) or refined vegetable oil or tomato sauce, so as to get correct net weight of contents. Net weights suitable for the three can sizes are:

No. 1 Tall can : 450g

8-Oz. can : 210 g

Quarter Dingley can : 106g

7) **Exhausting:** Exhaust the cans in a steam exhaust box for 15 min. at 100⁰C.

8) **Can Closing:** Immediately after heat exhausting, close the cans with code marked lids by means of a double seaming machine. Do not allow the can and contents to cool below 80⁰C before seaming.

9) **Processing:** The closed cans are to be washed clean and then loaded into the retort for processing. After closing the retort, give sufficient time to drive out all the air and raise the pressure and temperature to processing level. Then give the following processes.

No.1 Tall can with steaks: 100 min. at 12 psi (118⁰C) for fillets, 90 min.

8-Oz. can with steaks: 90 min at 10 psi (115⁰C) for fillets, 80 min.

Quarter Dingley cans with fillets: 50 min. at 10 psi (115⁰C).

10) **Can Cooling:** After the process time is over, cool the cans in clean water to room temperature.

11) **Storing:** Store the cans only after they are dry on the outside. Label them while dispatching.

Removal of skin: Two methods are employed for removal of skin from seer fish before obtaining fillets.

a) **Lye Peeling:** The fish steaks are immersed in boiling sodium hydroxide solution (2%) for 2 minutes followed by immediate washing in running water for about 15 minutes. The fish may later be dipped in 0.2% citric acid for 2 minutes to bring the pH back to the original value of fish muscle.

b) **Cook and peel method:** Here the fish are first cut into steaks and dipped in boiling water for the required period of time (1½ -2 minutes). The products are cooled sufficiently so as to remove the skin by hand operation.

Product Code: SEF 3: Seer fish fillets in oil

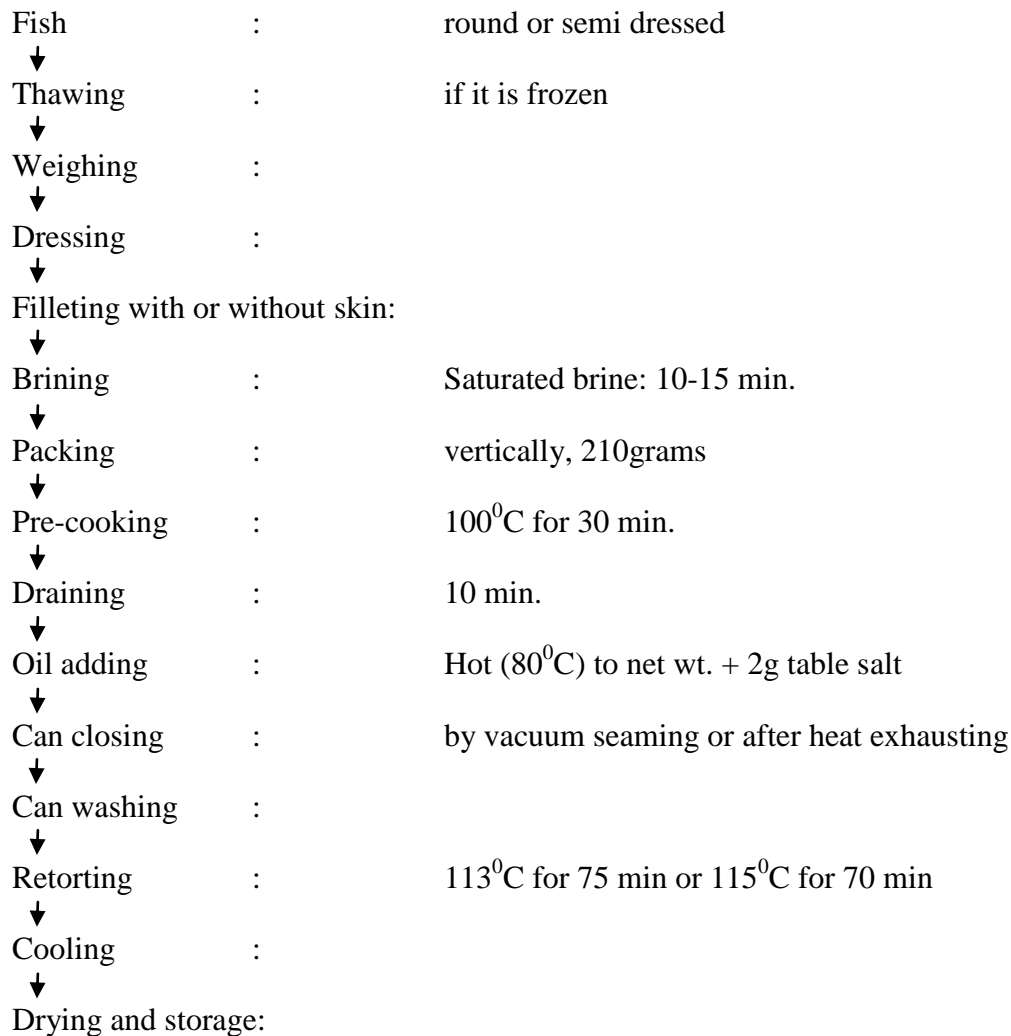
SEF T: Seer fish fillets in tomato sauce

Std. Solid Weight: Not less than 65% of net weight

Materials and Equipments:

Seer fish, round or semi dressed, knives, common salt, table salt, cutting boards, trays, cans, can closing machine, retort, refined oil, tomato sauce, balance, scale etc.

Flow Diagram:



Observations:

Weight of raw material :

Weight of dressed material :

Weight of steaks produced :
Weight of steaks after removal of skin :
pH of fish steaks before lye peeling :
pH of fish steaks after lye peeling :
pH of fish steaks after acid treatment :
Weight of fillets produced :
Weight before precooking (packed weight) :
Weight after precooking :
Number of persons involved and hours worked :
Number of cans produced :
Weight of filling media added :
Size of can used :

Calculations:

Calculate the dressing yield, steaks yield, lye peeling loss, precooking loss, filleting yield, canning yield, yield rate and efficiency.