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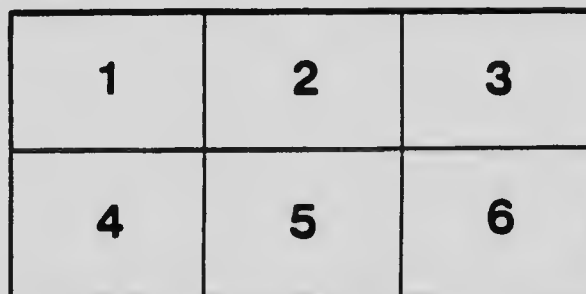
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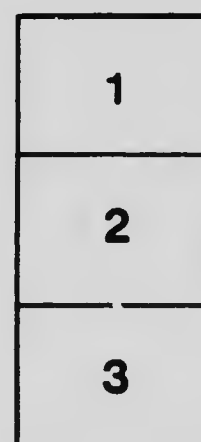
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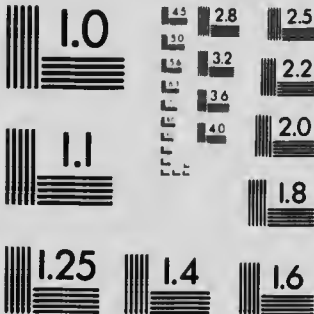
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A BRIEF MANUAL

DIRECTIONS *for* CURING
HERRING, COD, AND SALMON

Taken from R. J. Duthie's "The Art of Fish-curing,"
published by the Rosemont Press,
Aberdeen, Scotland

Compiled by
JOHN P. BABCOCK
Assistant to the Commissioner of Fisheries



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

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How to Cure Herring, Cod, and Salmon.



THIS bulletin on fish-curing is issued that residents and small dealers of Coast districts may have a manual to guide them in curing fish, which at times may be had in abundance at little cost. The entire text is extracted from R. J. Duthie's complete manual on "The Art of Fish-curing," published by the Rosemont Press, Aberdeen, Scotland; price 2s. 9d. Mr. Duthie's manual, for practical purposes, is the best work published on the curing of fish with salt. Those who desire to engage extensively in the business of curing fish will find in his book plans and details for the construction of plants and directions for curing, marking, and marketing these products that are thoroughly practical, and which have been adopted by the most successful concerns.

PICKLING HERRING.

Barrels or Kits.—At the smaller fishing-ports the price of fresh herring is usually too high to permit the smaller dealer to cure profitably, but chances of cheap fish are sure to come to him who waits. It is wise, therefore, to keep a few good barrels in stock—whole barrels, half-barrels, or kits, according to trade requirements—as well as sufficient salt for the purpose, so as to be ready to take advantage of the chance when it comes. If the operator is a novice to the trade and has no skilled workers available, he had better be content with one, or at most two, barrels at first; or, even better, he might commence by curing small balances left over from the counter trade, provided the fish have not been kept until they have become soft or stale. In the latter case, however, he should select a barrel or kit which the herrings on hand are likely to fill; remnants packed into the same barrel on successive days do not make a good cure.

If the barrels have not already been prepared, the curer should now "unhead" as many as he is likely to require, and either fill or thoroughly rinse them with water. If the barrels have previously been stored in a dry place, a good soaking is absolutely necessary. An old barrel or other good-sized vessel should be provided to hold the offal, which, by the way, should always be got rid of as quickly as possible after each day's work is finished. If the herrings are to be selected—and this should be done if they show much difference in size and condition—a basket, tub, or other vessel will have to be provided for each selection.

The knife universally used for the gutting of herrings is a sharp-pointed, short-bladed knife with a fixed handle, which should be obtainable at any ironmonger's shop. The extreme length of the blade is about $2\frac{1}{2}$ inches, and the handle is about 4 inches.

Scotch girls who are employed in the curing of herrings wrap cotton or linen rags round the thumb of the right hand and the thumb and at least the

forefinger of the left hand; and this is a good plan for any novice to follow to lessen the risk of accidents.

In gutting, take hold of the herring about the middle with the left hand, the thumb being over one side and the rest of the fingers over the other, and the throat of the fish exposed. Insert the knife through the gills, with the edge towards the operator; give the knife a sharp turn upwards, and draw the right hand outwards over the herring's head. If the operation has been entirely successful, the gills and stomach, etc., will have been completely removed; if it has not, a second movement will be necessary. Gentle pressure with the left hand assists the operation. In drawing out the intestines, however, care should be taken to draw the right hand *outwards* rather than *upwards*, as the latter movement is apt to tear the fish if they are tender. If the gutting is neatly and properly done, very little of the fish will have been removed—only the pectoral fins and upwards to the gills.

"*Rousing*" and *Packing*.—The most important process in the curing of herrings is known as "rousing." This is best done by hand in a large tub. A few platefuls of salt are first thrown over the gutted herrings, after which the packer turns them up thoroughly from the bottom of the tub, until every herring has come freely into contact with the salt. They are now ready for packing. A tight barrel or kit, damp inside, is placed beside the rousing-tub, and the packer lifts a couple of handfuls of the roused herrings, shaking the salt freely from them, and drops them gently into the barrel. Salt should not be spread in the bottom of the barrel before the herrings are put in. The packer commences by placing one herring on its back, against the side of the barrel; two others are placed against it, their heads to the sides of the barrel, and their tails meeting or overlapping; a middle herring is placed in front of the tails of the last two, followed by two more with their heads to the sides of the barrel, and so on until the tier is complete. The herrings should be set well up on their backs, and the tier should be tight. Salting is an important matter. The exact amount of salt to be used on each tier should depend on the size and strength of the fish, the strength of the salt, the market the herrings are destined for, and the length of time they are likely to be kept in stock. Large-sized herrings require more salt to each tier than small, and full herrings more than spent, but in no case should the herrings be buried in salt. As a general rule, one barrel of salt will be required to cure three barrels of herrings.

Upon the heads of the herrings of the first tier two herrings (known as "head herrings") are laid at each side, and above these the second tier is laid, the herrings crossing the first tier at right angles. Salt is again sprinkled over the tier, head herrings laid, and third tier crossed over the second, and so on until the barrel is full. Usually the herrings are packed above the level of the barrel, as they sink rapidly in the salt. On the following or second morning the herrings should be filled up level, the ends put in and "tightened," and the barrels laid on their sides. Before the filling-up it is usually advisable to lift off the top tier of the original, and wash the herrings in pickle, to remove any discoloration resulting from exposure to

the air. After the barrels have been laid on their sides for eight or ten days they should be bored in the bilge, set on end, the heads taken out, and the pickle run off through the bung-hole. A barrel of herrings will be required to fill up five or six barrels, and the filling-up should be done, when possible, with the same fish as those being filled up. Before starting to fill the barrels, the herrings in each barrel should be pressed down with the hands, and this will be most easily done while the pickle is being run off. The herrings to be used for upfilling should be well washed in clean pickle in a large-sized tub. A ring of herrings laid around the sides of the barrel, with their backs to the wood, will ensure firmness in the packing. The filling-up should be done in the same way as the original packing, except that each herring should be handled separately, and pressed into the proper shape for its position in the tier. Great care should be taken with the top tier, which, to make a full barrel, should show above the chimb of ' barrel in packing. Each herring should be pressed between the thumbs and fingers of the packer, so that the belly of the fish will be flattened out, and the herrings should be set straight up on their backs. When the tier is complete the heads of the herrings should be pressed down and *three* head herrings laid at each side. These also should be set straight on their backs. Very little salt should be laid between the tiers in the upfilling, and none at all on the top tier. A little clear pickle thrown over the top tier improves the appearance of the fish. Pressure is required to get the head in, the cooper usually having to get up on the barrel and bring his own weight to bear on the end. When the barrel is "tightened" it should be laid on its side and pickled at the bung, after which, if care is taken that the barrel does not leak, the cure is complete.

Pickling.—Immediately after a barrel of herrings is packed, a quantity of *cran made* pickle should be poured into it—about a bucketful to a whole barrel, and half that quantity to a half-barrel. The usual rough-and-ready method of making pickle is to dissolve salt in clean water until the liquid is strong enough to float a fresh herring or a potato, preferably the latter. A special form of hydrometer registering up to 40 per cent. is also used. Put into the natural pickle which herrings produce in the process of curing, this hydrometer usually shows a buoyancy of about 20 per cent. For herring-curing, pickle made from *crane* salt is generally used; and, as the curing of the fish depends most upon the pickle, it should show a buoyancy of 25 per cent.

HOW TO MAKE BLOATERS.

Salting.—If fresh fish are to be dealt with, the usual method of curing is to rouse them in dry salt upon a brick or pavement floor, turning them over with a shovel during the process of salting, and leaving them overnight in salt. In the morning they are washed through light pickle and hung on spits or tenters.

Hanging.—Spits, it may be said as well to say, are rounded wooden rods, 4 feet long, about the thickness of a man's finger, and sharpened at one end. As the wood is apt to get blunt, iron cones with sharp points are often fixed upon the points of the spits during the process of spitting. Occasionally

iron rods are used for spits, and these are much thinner than the wooden ones. To spit herrings, either for bloaters or reds, enter the sharp end of the spit below the gill-cover of the fish and push it out through the mouth. Hang the spits in the kiln—an ordinary kipper-kiln—in the same way as the tenters or kippers.

Pickling.—Curers who make preparation for doing a large business in bloaters usually have vats or tanks, large enough to contain great quantities of fish, constructed on their premises—sometimes below the floors of their stores. When herrings are plentiful and cheap, these vats are filled with roused herrings (usually sea-salted), which are then floated in pickle, and afterwards drawn out and smoked at the curer's convenience. A regular supply is thus assured for a considerable time, even although prices of fresh herrings should rise or the fishing come to an end.

Smoking.—Bloaters are smoked in much the same way as kippers, but a fire of hardwood billets is usually preferred to chips and sawdust. The soft fuel gives rather more colour than is desirable, as bloaters should be dried rather than coloured in smoke. Eight hours' light smoking will generally make the fish ready for market.

Packing.—Bloaters are packed across the box with heads all to one side till the tier is complete; then two or four herrings with their heads to opposite ends of the box are laid lengthwise across the tails of the fish in the tier. The second tier is packed across the box like the first, but with the heads of the fish to the opposite side of the box—that is, over the tails of the fish in the lower tier. Herrings are laid over the tails of the fish again, and so on till the box is full.

A Small Kiln.—The fishmonger who may be left with a balance of fresh herrings unsold—or any one who wishes to prepare a few dozen bloaters—may, instead of dry-salting, immerse the herrings in strong, clean pickle, and leave them in it overnight. In the morning the fish will be ready for hanging. It should be distinctly understood that the smoking of fish does not depend upon the size of the kiln. All round the Scotch coast, for instance, there may be seen small smoke-houses, in which the fishermen's wives smoke haddocks to perfection. They are generally rough wooden buildings, often put together by the fishermen themselves, perhaps 4 feet square and 6 or 7 feet high, with bars at opposite sides and suitable intervals for supporting the spits or tenters. Dwarf walls of stones or clay inside may protect the wooden walls from the fire. Even a large cask, with both ends out and a few holes in each quarter for ventilation, may be converted into a kiln fit to smoke a few dozen bloaters. In this case it is necessary to put the fire in an iron vessel, and to spread a sack or other heavy covering over the cask during the process of smoking.

HOW TO MAKE RED HERRINGS.

Curing.—Rouse the herrings well and pack them into barrels, with plenty of salt about them, the fish being packed much flatter than herrings cured for exportation to the Continent. Herrings intended for "reds" are

not gutted, although gutted herrings are occasionally smoked as an after-thought. After standing on end for two or three days the barrels should be filled up, tighter, and laid down. They should be allowed to lie on their sides for at least ten days—some curers prefer to leave them six weeks or more—care being taken to keep the herrings well pickled.

The curing might also be done in the close tanks referred to in the notes on bloater-curing. In this case the herrings should be well roused on the floor, and turned over, during the process of rousing, with a wooden shovel; then, when being put into the tanks, salt should be thrown over them freely, and strong pickle afterwards poured in till the herrings are afloat. Curing in barrels is, however, the more satisfactory method.

Steeping.—When the herrings are sufficiently cured they should be taken out and spitted in the same way as bloaters, the sharp end of the spit being entered under the gill-covers and pushed out through the mouths of the fish. After this the herrings have to be steeped in water to extract some of the salt. The "steeps" used are generally long, shallow vats, about 4 feet wide. Across these the full spits are spread, the "steeps" are filled with water, and the herrings left to soak for a night. In the morning the water should be drained off and the vats refilled with fresh water.

Drying.—After the herrings have been soaking for about thirty-six hours they should be removed from the water. If the weather be favourable the spits should be spread upon racks in the open air to allow the herrings to dry in the wind, after which they should be hung up in the kiln to be smoked. Should the weather be wet or otherwise unfavourable for outside drying, the fish would have to be hung up in the kiln at once after removal from the steeps, but in that case they would have to be allowed to "drip" for some time before the fires were applied.

Smoking.—The smoking is usually done nowadays in modern kipper-kilns. The herrings should first get the smoke from a small billet-wood fire for one night, and then be allowed to cool all the next day and night. The following day and night another billet-wood fire should be applied, and the fish then allowed to cool again for twenty-four hours. Afterwards fires of chips and sawdust should be burned, the fish being smoked and cooled alternately till the required colour and firmness have been obtained. It might take from three to six weeks, according to the requirements of the market for which they were destined, before the fish were satisfactorily smoked.

Packing.—When red herrings are put into small boxes they are packed in the same way as bloaters, the tiers being laid *across* the box, with four herrings lengthwise over the tails of each tier. To pack in barrels commence with the heads to the side of the barrel, and pack the herrings on their sides till the opposite side of the barrel is reached, when about a third of the bottom of the barrel should be covered. Commence again with the heads to the side of the barrel, but so that the tails of the herrings previously packed will be completely covered, and pack as before till the opposite side of the barrel is once more reached. Begin again with the heads to the side of the barrel, and work across till the tier is finished. Repeat this process

tier after tier till the barrel is full. The red-herring barrel is a wooden-hooped, dry-ware cask, like the barrels in which all the smoked haddocks used at one time to be conveyed to market, and there should be from twenty to twenty-five fair-sized herrings in each tier. The packing should be *flat*; that is, the herrings should be laid on their sides, both in barrels and in boxes. It is scarcely necessary to say that the fish ought to be allowed to cool thoroughly before being packed, otherwise they will deteriorate.

HOW TO PICKLE COD

Plant, etc.—The requisites for this trade are an ordinary fish-house, with bench and vats, a supply of good fishery salt (second Liverpool generally preferred), and a stock of cod-barrels, which are a little smaller than ordinary herring-barrels. Offal-barrels, carrying-baskets, scrubbing-brushes, and a set of good knives are, of course, indispensable.

Water.—The water-supply is a most important consideration, as upon its purity the condition and appearance of the fish when finally cured will largely depend. Spring water containing a moderate solution of lime will usually give very satisfactory results, but brown, mossy water is apt to leave a stain on the fish that will detract from their value when offered for sale. So well are some curers aware of this that they will cart water in barrels considerable distances from suitable wells rather than use the public water-supply if the latter does not answer their requirements.

Gutting, etc.—The cod should be headed and gutted and then put into clean water. They may be washed and taken out of this water, either immediately or after about an hour's immersion; but they should not be left too long in it.

Splitting.—The splitting cannot be too carefully and neatly done. So much depends upon the appearance of pickled cod when offered for sale that even greater care is required in handling them than is necessary with fish that are to be dried. Different curers' methods of splitting often vary in certain details; but the following is the method followed by some successful North County curers: The gutted fish should be laid on the bench with its tail towards the splitter, who should take hold of the upper lug of the fish with his left hand, and with his right hand enter the knife at the vent and draw it down above the bone to the root of the tail. He should then give the fish a half-turn—its tail outwards and its shoulders inwards till its back is turned towards him—and, raising the lug with his left hand, split the fish carefully from the bone from the shoulder downwards, leaving as little fish on the bone as possible, and at the same time trying to bring the fish away perfectly clean and smooth. He should next give the now split fish another half-turn, so that its shoulders will be towards and its tail away from him. Then, steadying the fish with his left hand, he should carefully run the knife down under the bone so as to separate it from the fish, and then cut the bone off about twenty or twenty-two joints from the tail. In doing this he should cut through two joints at once, so as to leave the appearance of the figure 8 on the end of the remaining bone. The outer

ends of the rib-bones, if still adhering to the fish, should be carefully *cut*, not torn away.

To make sure that the remaining bone will be properly bled, it should be pierced with the knife near the tail; or, if preferred, it may be split down for 2 or 3 inches from the point of separation.

Cleaning.—The black lining of the stomach should next be removed, and any rags of fish or skin which may be visible should be carefully cut away. The fish should then be washed thoroughly, a hand-brush being used both inside and out. The bone should receive special attention, to make sure that the blood is thoroughly removed.

Pressing.—After washing, some curers press the fish for a couple of hours. This may be done very easily by laying the fish on a bench with boards and weights above them, the object being to drain off the water and any remaining blood from the fish. Other curers, again, object to pressure being applied, on the ground that it makes the fish look thin.

Salting.—The fish should then be salted into vats. Good second fishery Liverpool salt is usually considered best for this purpose; but if a soft cure is desired, Spanish salt is sometimes preferred. In either case the fish should be completely covered with salt, and the salting should be regular, otherwise the fish are apt to have a spotted appearance when cured. The actual quantity of salt necessary will, however, depend to some extent upon the length of time that the fish are likely to be kept before being sent to market, and this can only be learned thoroughly by practical experience. Cod which are to be kept for some time should be salted more heavily than fish that are to be disposed of at once. Three-quarters of a hundredweight of salt may be considered sufficient to cure a barrel of cod.

In salting, the fish should be laid in pairs, face to face, just as kippers are packed. If laid otherwise, there is always a risk that the inside of one fish may be discoloured through contact with the pigment or natural colouring-matter of the skin of the fish next to it. Extra salt should be added to the top tier; and, as the fish make their own pickle, weights should be put on them to keep them down.

Drawing, Washing, and Paring.—After lying in the curing-vat for not less than forty-eight hours the fish should be drawn out of the pickle. During this process they should be well washed, either in their own or in fresh-made pickle. As each fish is washed it should be laid on the bench in such a position that the pickle will drain from it. After they are washed the fish should be taken one by one and carefully *pared*. The anal fins should be neatly cut away, and any rags of fish or skin that may have been left about the sides or shoulders should be pared off, so as to leave the fish perfectly clean and well trimmed.

Packing into Barrels.—If they are obtainable, birch or other hardwood barrels are preferable to fir. The latter may impart a flavour of the wood to the fish; the former will not. The packer should lift and handle the fish carefully, so as not to damage them. The best way is to grasp the tail of the fish with the right hand and the shoulder with the left, the skin of the fish being downwards. The fish will thus fall into a partial fold and allow

of its being put inside the barrel easily. The bone of the fish should be laid next the side of the barrel. Two medium-sized fish will make a tier, laid head and tail alternately, but overlapping when necessary. A large fish might occupy the whole circumference of the cask. With the exception of the upper tier, which should be laid back up, the fish may now be all packed with the skin downwards, as with the two washings the slime and pigment should be thoroughly removed from the skin.

Salting.—If the fish are destined for immediate consumption, no salt will be required between the tiers, *provided they are already well cured.* This can, of course, only be known by the touch of an experienced curer, who will be able to tell by the firmness of the fish. As a general rule, however, a light sprinkling of salt is advisable. The barrels should be filled quite full and the ends pressed in and "tightened," the barrels tiered on their sides and bored on the bilge.

Pickling.—Pickle to put into the barrels should be made a few days beforehand. Pickle is made by dissolving salt in clean water until a potato will float, or until a salimeter immersed in it will register about 25 degrees. As for the washing of the fish, so for the making of the pickle, the clearer and purer the water the better will the cure be. But before being used the pickle should be strained once or oftener through flannel to make it perfectly clean and free from sediment, after which the barrels should be filled with it to the bung and kept so.

Repacking.—Should they have to lie on hand for a few weeks, a careful curer will, before sending his fish to market, open the barrels, take out the fish, and, if necessary, wash and trim them again. After repacking, new pickle should be put into the barrels.

The Small Dealer.—Although the foregoing notes are intended as a description of the working of a fair-sized business, a small dealer who might be left with some fresh cod unsold should easily manage to cure them in pickle at very little cost by following the above instructions. A couple of good-sized tubs, a clean, tight barrel, and 1 cwt. of fishery salt would be sufficient stock to start with.

When salting the fish in the tubs it would not be advisable to put one day's fish down upon the top of the previous day's cure. Each day's fish should be salted in a tub or tank by themselves. If the dealer has an outlet for them, his fish should be ready for market after forty-eight hours' cure—or even twenty-four hours if they were going into immediate consumption. If not, they might, after being drawn, washed, and pared, be packed into the same barrel, one day's fish on the top of the other, as they became "due" or ready. A little salt would have to be sprinkled between the tiers, clean pickle sufficient to cover the fish would have to be poured into the barrel, and weights would have to be laid on the top tier to keep all the fish immersed until the barrel was full and the end put into it.

HOW TO KIPPER SALMON.

SCOTCH METHOD.

The Scotch method of kippering salmon is simple enough: Wash and head and split it down the back, removing the roe and intestines; then wash again to free it from the blood-stains, etc. Mix equal quantities of strong fishery salt and brown sugar; lay the fish in plenty of this mixture, and allow it to lie in it for forty-eight hours. The fish might be well rubbed with the preservative before being salted down in it. After forty-eight hours, hang the fish up, either in the open air and sun or in an ordinary kipper or finnan kiln. Three small double-pointed sticks should be fixed through the skin at intervals along the back of the fish, to keep it spread out during the process of drying. If dried in a kiln, a few hours' smoking is recommended. Some curers add a little saltpetre to the salt and sugar.

With a fish so rich and fatty as the salmon, it is plain that the above process can only be regarded as a temporary cure; and the fish so cured will only keep for about the same time as kippered herrings or finnan haddocks.

NORWEGIAN METHODS.

Mild Cure.—Cut the head off and split the fish down the back. Wash it clean and then put it in salt or ordinary pickle. After lying in the pickle for three days the fish is taken out and washed in clean, fresh water and then stretched upon pieces of lath. These pieces of lath are about an inch and a half broad, but quite thin. They are cut to a length corresponding to the breadth of the fish and sharpened at the ends. One of these spits is put across the back of the fish at the "lugs" or shoulders, another about half-way down, and, if the fish is very large, another still farther down, the points of the spits being stuck through the skin of the fish. The fish is then "tentured" and hung up in a chimney, where it is smoked over a fire of fir branches for a day and a half or two days. Salmon cured by this process come out something similar in appearance to an Aberdeen-cured haddock, but rather darker in the colour.

Hard Cure.—Salmon meant to be kept for two or three months are much harder cured. In this case the fish are split into halves to facilitate the operation of curing, and to make them easier to handle and to stow in the barrels. These should be clean and tight, and preferably of hardwood. Although not insisted on, it would be advisable first to rub the fish well with a mixture of brown sugar and fishery salt, as in the Scotch method, and a little of the same mixture might be thrown in between the pieces of fish as they are packed into the cask. Hard packing should be avoided, sufficient room should be left to let the pickle circulate freely. The barrel should be filled quite full of strong, clean pickle (which in this case had better be filtered), the end put in and "tighted," and the barrel laid on its bilge. If properly cured, salmon treated in this way should keep for two or three months, or even longer if required. The barrel should, however, be opened occasionally and the fish examined. If there were any risk of

the pickle turning stale, it should be poured off and fresh pickle substituted, the fish being well washed in clean pickle before being repacked. As a precautionary measure, the fish might be taken out, washed, and repacked after being two or three weeks in cure, even if there were no suspicion of staleness.

When required, the pieces of fish should be taken out, well washed in clean, fresh water, and smoked in the same way as the milder-cured fish. Owing to the rich nature of the fish, this is the only method by which it seems possible to preserve salmon for any length of time, apart from tinning. Dry-curing would fail to preserve such a fat fish. In Norway all the smoking is done in the chimneys of the dwelling-houses, in much the same way as finnan haddock curing was originally done on the Kincardineshire coast.

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