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Accounting for the Fish-canning Industry

BY HARRY W. MOORE

GENERAL CONDITIONS

The fishing and packing industry on the Pacific coast has attained sufficient magnitude during and since the war to warrant a discussion on the accounting systems in vogue and the methods of ascertaining costs. The purpose of this article is not to go into detail on minor points but to endeavor to draw attention to the variance between the problems that will confront the accountant if he is called upon to assist one of these industries.

It will probably be well to digress for a moment to present some of the statistics relative to this industry. The southern district, as outlined by the fish and game commission, comprises the Los Angeles and San Diego sections, which reach from Santa Cruz Islands to Mexico. There are about eight hundred fishing boats in this district, ranging in size from twenty feet in length and twenty to thirty-five horsepower to seventy-five feet in length and up to one hundred horsepower. The smaller boats are "hook and line" boats while all the larger boats carry seines. The seine boats are rapidly coming into prominence and in the past few seasons have caught the greater portion of the fish. These eight hundred boats employ approximately four thousand fishermen, two-thirds of whom are Japanese, according to the latest statistics. Over four million dollars are paid each year for the catch of these boats, the investment in which is about five million dollars. The investment in the boats is carried in some instances entirely by the fishermen, but in a large number of cases the boats are financed by the canneries which contract for the purchase of the fish.

The investment in packing plants in this district is approximately seven and one-half million dollars. The plants employ, during packing seasons, six thousand people with an annual payroll of three million dollars. The output per season totals over one billion cans of fish with a value of nearly twenty million dollars.

The fish-canning industry is subject to the seasonal catches of fish. The tuna and albacore season is for four months, June, July, August and September, while the sardine season runs from

the middle of December to the last of April. These are the two main packs of fish, although many canneries pack mackerel, yellowtail, bonita, skipjack and various other fish, the catch of which is made in limited quantities at certain seasons of the year.

The tuna and albacore schools start in the southern waters and migrate north as the waters grow warmer in summer. The boats follow the schools of fish and it is therefore necessary for the boats to deliver the fish near the place where they are caught. The canneries maintain barges, which are always anchored in the vicinity of the place where the boats are fishing, and receive delivery of the fish at these barges, transporting the fish to the canneries by means of "tender" boats. This imposes on the canneries a barge expense for the purchasing of the fish and the tender service for hauling them to the canneries, which adds greatly to the cost per ton of fish. Some packers are now experimenting with cold storage and refrigerator ships to operate further south and thus obtain a longer packing season. Floating canneries have also been tried but thus far with no great success. The sardines when caught must be delivered direct to the canneries in as short a time as possible, as sardines will not stand handling and grow soft in a few hours after being taken from the water, so that the boats fishing for sardines operate only in local waters. Sardines abound in the local waters nearly all year but during the warm months they are not suitable for canning.

ASSETS

The assets differentiating the accounting of fish canning from other industries are the large investments in finished goods, raw material and supplies, and in the fishing fleet. The finished product, while readily salable at certain seasons, is often very difficult to sell in the season in which it is packed. It is also necessary to hold certain packs for a period before shipping to sort out the swells and leaks which develop. In figuring the cost of finished goods for inventory purpose an allowance must be made for this "mortality", which is the term used by the packers for this loss. Owing to the runs of fish, which are very irregular, the inventory of raw material and supplies must necessarily be large to take advantage of the fish while available. The cannery may operate day and night for a few weeks and then remain idle for some days. The raw materials, such as cans and cases are not always obtainable on short notice, as all the canneries, while the

fish are running, are desirous of packing the greatest tonnage possible and are endeavoring to purchase these supplies at once. The company that has sufficient working capital to purchase in advance of the requirements is in a much better position to take advantage of the fish while running. Olive oil, which is of an imported quality, must be purchased some considerable time before it is to be used, as also must tomato sauce, because both are subject to great fluctuation in price and can be purchased to better advantage in the season in which they are produced. Cottonseed oil is nearly stable throughout the year and is purchased only slightly in advance of the requirements. The necessity of holding finished goods and of keeping an adequate supply of raw material on hand requires a large working capital and a careful system of perpetual inventory, verified frequently by physical inventory.

The financing of boats presents a problem with which the accountant must proceed very cautiously. The canneries each own at least one tender boat and one barge to facilitate the purchase of the fish. They also own and operate their own fleets of fishing boats, or finance boats under contract. If a company owns its own fleet it is only necessary to see that the title is in the name of the company and that sufficient depreciation has been provided. If the boats are financed under contract, a mortgage is secured on the boat and equipment, which, if the boat is registered, must be a registered mortgage and filed with the collector of customs at the home port of the boat. If the boat is not registered an ordinary mortgage recorded with the county recorder will suffice. The names of the boats are very often changed, especially the boats operated by Japanese. It is very necessary that the contract and mortgage be carefully scrutinized and, if possible, the name of the boat compared with the most recent fish tickets, which show the name of the boat and the name of the fisherman. The insurance policies on all boats should be investigated as the risk on boats is extremely hazardous. The canneries not only insure the boats they own but also carry policies on all boats to which they have advanced money. All boats are subject to maritime liens for supplies furnished or repairs made, and the canneries to protect their interest are often called upon to pay bills contracted for by the boats. In addition to the mortgages on boats, the canneries generally are obliged to make large advances to the fishermen on open account.

One of the points relative to fixed assets is the use of can-sealing machines which are leased from the company whose cans are being used on a rental contract. Rental is paid for a period of five years, after which the cannery has a usable right to the machine, but the machine nevertheless remains the property of the can company and in the event of violation of the contract it reverts to that company. It is the opinion of the writer that the rentals paid are a cost of operation and should not be capitalized. One appraisal company and many accountants capitalize the rental thus paid on the "right of usage."

The rate of depreciation on machinery is very high. The life of a machine is greatly reduced by the long periods of time during which it lies idle, and by the extreme pressure under which the plant is worked during the packing season. The machinery being near the salt water corrodes very quickly. While the cannery is operating it must be kept in the highest degree of cleanliness and must be washed very thoroughly, which keeps the machinery damp for the greater part of the time. The equipment used in the packing of tuna and albacore is very different from that required in the packing of sardines, the only parts applicable to both being the cleaning and packing tables and the retorts.

CANNING PROCESS

It will be necessary for the reader to have a general idea of the process through which each species of fish passes to understand properly the problems that will be confronted in the distribution of cost.

Tuna and albacore. Tuna and albacore are large fish of the tunny species. The albacore are caught mostly with hook and line while the tuna are seined. The albacore have never been successfully seined owing to the fighting propensity of the fish and the difficulty in landing them. The two fish are much alike and are often packed under the same brand name although the albacore is the whiter meat when packed and brings a better price. The additional sales price is, however, offset by the increased price paid to the fisherman for the fish, as the hook-and-line catches are much smaller than the catches by seine. The National Cannery Association has recommended that albacore be labeled as "standard white-meat tuna" and the tuna as "blue-fin tuna," and this practice is now almost universally followed by the packers. The market for these packs has always been far in excess of the supply and for many years they have sold at a premium.

They are packed in cottonseed oil in three sizes of cans: quarters, halves and ones, forty-eight cans to the case. Tuna is packed for the Italian trade in olive oil in the quarter size only, one hundred cans to the case. Both varieties are packed in the round sanitary can which is termed by the packer the "flat."

The process for packing tuna or albacore, as well as other large fish such as yellowtail, bonita and skipjack, is the same. On arriving at the cannery the fish, having been previously cleaned on the barge, are placed in racks, run into cookers and cooked for two hours. After the fish have been cooked the racks are pulled out and the fish are allowed to cool. They are then put on the cleaning tables where they are cleaned by women. The skin is taken off and each fish is split down the center and the bones removed. The dark strips of meat are cut off, leaving two long pieces of "solid chunk" which are cut crosswise and packed in the can. The outer edges of the can are filled with the smaller pieces of white meat that break off in cleaning. The dark meat and the fine white meat are saved and packed in a product called "light and dark meat tuna," or ground and spiced and packed as "potted," "minced" or "sandwich tuna." The cans when filled are placed on a conveyor which leads through an automatic oiler and salter where the cottonseed oil and the salt or brine are put into the can. The conveyor then carries the can into the can-sealing machine which places and seals the lid in one operation. After sealing, the cans are washed and retorted for a period of two hours, which completes the sterilization. The cans after cooling are labeled by an automatic labeling machine, and cased and stenciled ready for shipment. Nearly all companies now mark each case with a code to show date of pack and any other information desired.

Sardines. The sardine is a species of small fish of the herring family which run in great schools throughout the entire year. Sardines are used as bait for the larger fish as well as for canning. The fish used for canning run in various sizes and are packed in styles of pack according to size. Small sardines are packed in cans, termed by the packers as "quarter-square" and "half-square" key-opening cans. These small sardines are packed for the best trade in imported olive oil and only the best fish are used. The cheaper grades or "seconds" are fish not desirable for first-grade pack, and are packed in cottonseed oil, tomato sauce or mustard. The bones are sometimes "pulled" from the

higher grade of fish, making a specialty pack of boneless sardines. The larger fish are packed in "oval" or "half-oval" sealed cans and are canned in tomato sauce, mustard or "soused," a sauce prepared of vinegar and spices.

Sardines when received from the boat are put through a scaler and are flushed by water down a conveyor into the cannery. They are at once cleaned and the heads cut off, a process which must all be done by hand. The fish are then washed and put into brining tanks where the salt water brines out all the blood and salts the fish for packing. After brining for one hour, the fish are sorted into sizes and spread out in rows on flakes or trays, each fish being kept separate, and put into forced heated-air dryers where they are thoroughly dried. The fish are then put into wire baskets and fried in cottonseed oil, and after being allowed to cool are packed into cans. The condiments are added just prior to the sealing of the cans. Can-sealing machines are used, a separate machine being available for each style of can. The cans are then retorted and are ready for labeling. The key-opening cans have a soldered bottom and often this bottom is sprung under the pressure of the retort, causing leaks. It is therefore necessary to hold these goods until a sufficient period has elapsed to show whether or not any leaks may develop. They are usually packed in sawdust during this period of a few weeks and then are taken out and labeled. All labeling on both square and oval cans must be done by hand. The square cans are labeled with top and side labels and the oval ones with side labels only. Lithographed cans are now being used by some canneries in place of labeled cans. The cost of lithographed cans is slightly higher but the increased cost is more than offset by the saving of labor in handling.

Mackerel. The mackerel is a fish differing from both the sardine and the tuna. The size ranges from six to thirty inches in length. The fish are packed in half-pound "flat" cans and in the one-pound "tall" cans which are also used in packing salmon. Mackerel are cleaned and then cut on a disc cutter into pieces of the length required for the "flat" or "tall" can. After the fish have been packed into cans, the cans are placed in trays, bottom side up, and put in cookers where the water is cooked out of the fish, after which the cans are sealed and retorted.

All canned fish in round, flat or oval cans are packed with forty-eight cans to the case, while the square cans are packed with one hundred cans to the case.

ACCOUNTING SYSTEM

The system in vogue in fish canneries is in general the same as that used in any other manufacturing company. The only record necessary in addition to the general books is a "boat" ledger in which are kept the open accounts with the fishermen. The transactions on these accounts are numerous and the accounts are seldom closed while the boat is fishing for the company. The boat draws supplies for which the cannery pays and charges the account of the fisherman.

Sales are made by nearly all canneries through brokers. The goods are shipped "sight draft against bill of lading" or on "letters of credit" less a cash discount of usually one and one-half or two per cent. Some of the canneries maintain their own sales departments, thus eliminating the commission to brokers. The drafts with the bills of lading are discounted at the banks, the banks charging interest from the discount date until paid. It is very essential to keep a draft register to know the contingent liability that exists for drafts outstanding.

The cost of storage of finished goods and the interest on the cost of the goods from the date of pack to the date of shipment are a considerable sum. It is contended by some authorities that these are proper charges to the cost of the goods, but inasmuch as the goods are held until a time when salable, it seems to the writer preferable to treat such expenses as selling and financial costs. If interest and storage were to be added to finished goods, they could, by using the same reasoning, be applicable to raw materials which must be purchased in advance of requirement and this would greatly inflate the cost. Moreover, if such procedure should be followed at all, it would be difficult to find a line of demarcation.

COSTS

In ascertaining the cost of manufacture it is necessary to provide separate cost sheets for each size and each style of pack, and for these sheets to follow each pack from the time that the fish arrive at the cannery until they are labeled and cased. Where the goods are held for a period before labeling and casing, an arbitrary charge based on past experience can be made to cover labeling and casing, and the cost sheets closed. The cost of labeling remains comparatively stable.

Raw material. The raw materials used in the factory in packing are raw fish, cans, salt and the condiments in which the fish

are packed, as olive oil, cottonseed oil, tomato sauce, etc. The warehouse uses labels, paste, glue and cases. The cans, labels and cases can be readily accounted for by the warehouse reports of materials issued and can be applied to the cost sheet according to sizes. The raw fish can only be applied to the cost sheets on a per pound basis. The total weight of the fish received can be obtained from the record of fish received and the total weight of the fish packed can be obtained by multiplying the number of cans of each size by the number of ounces per can: this will give the total fish packed of each size, as well as the ratio of shrinkage and waste in processing. The per pound cost of the fish processed can be readily obtained and this may be used as a basis for charges to the cost sheets.

The apportioning of olive oil, cottonseed oil and tomato sauce can be obtained by learning the weight that is placed in each can and verifying that total by the total as shown as issued from the warehouse. These ingredients are placed in cans in nearly all packs through an automatic pump attached to the sealing machine which gauges the amount placed in each can to a certain number of ounces. The pumps are fed from vats which are kept filled by an automatic float gauge on the pipes leading to the tanks in the warehouse. The warehouse tanks are measured at the beginning and end of each pack, and therefore the total amount of oil issued can be readily verified by the total oil used in cans sealed.

Labor. A large portion of cannery labor is performed by women on piece work or hour work. The canneries use a uniform time card which provides for both piece and hour work for the day. The cards are divided as to cleaning and packing and are recapitulated at the end of each day and applied to the cost sheets. The labor of the men is more general, very little being applicable against particular operations, and it must, therefore, be prorated each day on the basis of the tonnage received.

Overhead. The question of overhead is one of the most difficult in cannery accounting. The pack of tuna and albicore may range from thirty to one hundred thousand cases a season and the pack of sardines may vary fully as much. The entire question of pack rests upon the run of fish and, therefore, the only safe basis is to take the average pack over a period of years. There is considerable discussion among authoritative cannery accountants as to the problem of idle time. It is the writer's con-

tention that all packs of fish should bear their portion of the idle time, and that it is best to use the system of charging all overhead items into a general overhead account. A rate of overhead should then be fixed on the basis which is most equitable. Some canneries distribute overhead on the basis of direct labor, others on the basis of prime cost, while some have more elaborate systems and use the machine-hour method. The simplest method seems to be the direct-labor method and from observation it has been found that the overhead for packs will very nearly follow the direct labor. The amount of labor required on the various packs regulates the time required for them to pass through the cannery and the rate per hour is stable throughout the operation. This method gives a very accurate basis. The general overhead account may show a credit balance during heavy packing seasons, but this will be absorbed by the idle periods. Another method used in some canneries is the per case method. This worked very satisfactorily as long as the trade was calling for one size of pack, but with the advent of variation in style and size of pack this method fast went into discard.

REPORTS

Fish reports. Fish reports are prepared each day showing the catch of each boat for that day and the total catch for the year to date. This record can be used to apportion the various kinds of fish to the cost sheets. It also shows which boats have the best record during the season, which is valuable data in making contracts with the fishermen.

Factory report. The factory report is prepared daily by the superintendent or his factory clerk and covers the record of the operations for that day, including cans packed and cans smashed in sealing machines or used for testing.

Warehouse report. The warehouse report covers all goods received from the plant into the warehouse, and also a record of all raw materials issued or goods shipped out.

Auditor's report. The auditor's report is prepared daily by the auditor to furnish information to the management regarding factory operations and general information relative to the business. The report contains a record of the tonnage of fish received and the cases packed therefrom, giving the average number of cases packed per ton. It also shows a record of the larger raw materials as cans, olive oil, cottonseed oil, tomato sauce, cases,

etc., giving the amount on hand at the beginning of the day with the raw materials used that day, and showing the closing balance. This enables the management to foresee any shortage that may exist in the stock. The record also shows the finished goods on hand at the beginning of the day, the pack for the day, the shipments if any, and the closing balance, as well as any other information that may be of interest to the management.

BY-PRODUCTS

The by-products of the fish-canning industry consist mainly of fish meal and fish oil or fish scrap. Many companies now operate in conjunction with the cannery a meal-and-oil plant; others sell the scrap outright.

If a meal-and-oil plant is operated the scrap should be charged to the plant at a fair rate per ton and the labor used in operating should be charged direct. A portion of the general plant overhead should be applied against the operations of the meal plant or else the steam and power used therein should be metered and charged direct to show the actual result of the operation of the plant. At certain seasons of the year sardines are caught in too great quantities for canning, and the fish are purchased at a reduced price and put directly through the meal-and-oil plant. Fish meal is pulverized and sacked and sold for chick food and fertilizer. The oil is refined and sold for hardening metals. It is also used in paints and for spraying fruit trees.