THE TREND OF CHANGES IN

PACKING SHORTENING

Within the past few years there has been a tremendous change in packaging Tin pails which were previously used almost exclusively for small packages have been largely replaced by cartons. The adoption of cartons started with the one pound (butter size) cartons, and vegetable shortening producers were skeptical for a long time about even these one pound containers. They were, therefore, adopted more generally as pure lard containers than for vegetable shortening at first.

The more general introduction of refrigerated display cases in retail groceries undoubtedly has assisted in making possible the general adoption of cartons. And just as soon as the one pound size began to be accepted there came an amazingly rapid demand for twos, fours and eights.

Ordinary tin containers with crimped tops, sometimes called "summer" covers, and loose covers were not very good from a stability standpoint. The contact of the shortening with the metal and the flux on the seams may have tended towards destabilizing. Most containers were far from being air tight. Yet well made tight tins, sealed under vacuum, are a high class package, and properly prepared shortening may keep exceptionally well therein.

Cartons are a good, cheap package. They may be prepared with grease-proof bags, which will not tend to promote oxidation and which may be sealed practically air tight. A vacuum is, of course, out of the question with such containers.

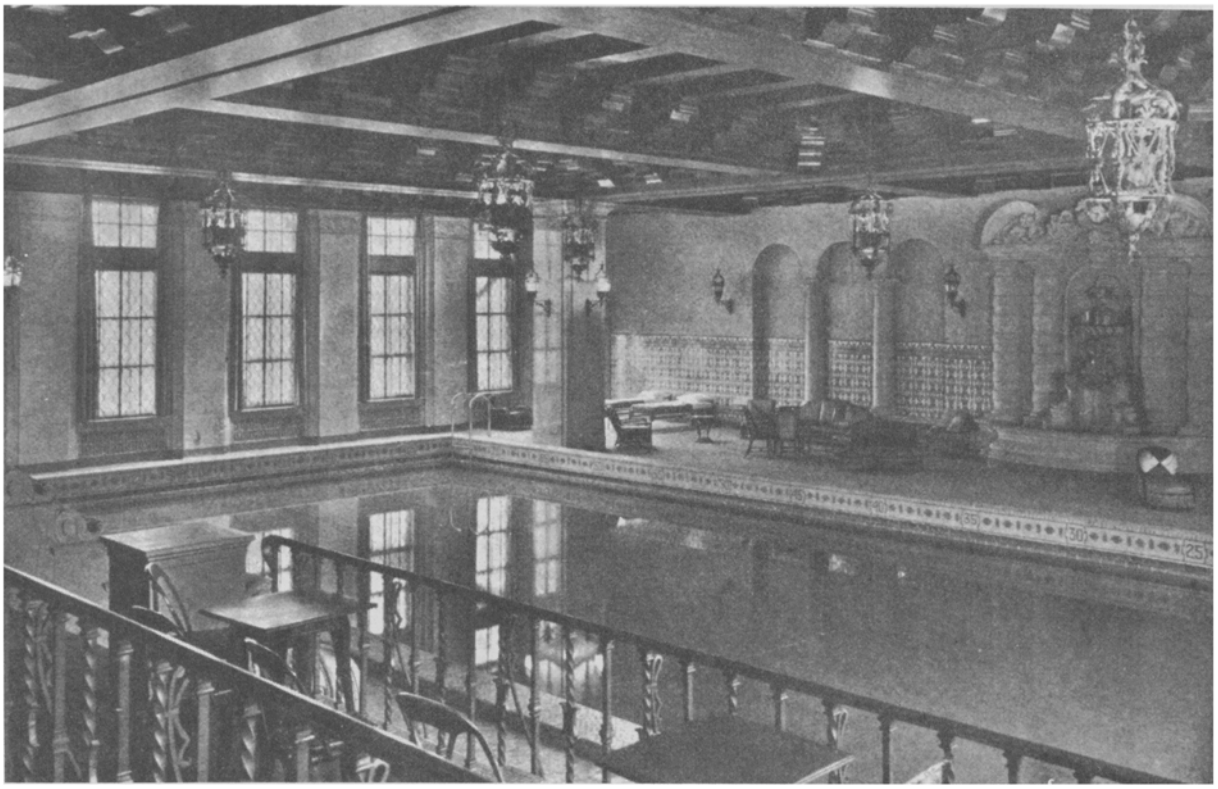
Sanitary Steel Barrels

Wooden barrels and tubs were standard containers for vegetable shortening for many years, although steel containers found earlier favor as an oil container. Heavy, sturdily-built, removable head containers have been used for some time for vegetable shortening, lard, etc., for local deliveries and short hauls on a strictly returnable basis. The heavy tare weight of this package prohibited its wider use for shipment to more distant points.

At the present time there is a strong tendency to swing to lighter barrels, more comparable in tare weight with wooden packages. It appears that the industry is now turning to this type of package almost as rapidly as it swung from tins to cartons.

These lighter steel packages are now not only being produced at less weight than a wooden barrel with far greater strength and flexibility, but they may be suitably coated with an extremely permanent, perfectly sanitary coating which removes effectively all of the hazards of promoting oxidation. Unlike the wooden barrel, this package may be made perfectly tight, eliminating danger of oxidation from without. Also removal of the head is the work of just a moment by the most unskilled laborer, leaving the barrel in perfect condition, to be instantly sealed up as easily as the head was removed, whereas removing the head from a wooden tierce or barrel requires the service of a skilled operator, involving partial dismantling of the barrel and, generally, loss of product during the operation. Heading up of the barrel and re-opening is too arduous a task to be undertaken when only part of the contents are consumed, so the head generally remains off, resulting in unsanitary conditions in the customer's establishment. Even when wooden barrels are silicated, the loss from soakage and wastage over steel barrels is variously estimated at from one to three pounds. Nor does the baker or other large customer relish the wood splinters and silica solids which may be included in scraping out the inside of the wooden barrels.

The general popularity achieved by light 100 pound drums of the type which required crating may also be succeeded by the more rugged fractions of the coated steel barrel with the quickly removable heads which require no crating and are not so subject to seam splitting and to heads jarring off, with attendant loss of product and the creation of unsanitary conditions. These drums are strong enough to require no crating. Their increased cost over the lighter drums and large cans is largely offset by reduced cost of handling,



American Oil Chemists' delegates will enjoy the swimming pool at the Medinah Club this fall

saving in crates and in product.

So the case in favor of steel barrels appears to be as follows:

1. Better appearance for the package.
2. Better sanitary conditions in handling in the customer's plant and increased keeping quality for the product.
3. Ease and saving of packing; and ease of handling in the customer's plant.
4. Better resale value of the used container for the customer.
5. Lighter weight—savings in freight and easier handling.

Typical Methods and Conditions of Manufacturing in the Production of Sanitary Steel Containers

In gathering material on this subject, the products and production methods of one of the large steel barrel manufacturers who is supplying these steel barrels with full removable heads to many of the large companies, was used as an example.

These sanitary lined, removable head steel containers produced by this company are made in sizes of 1 to 65 gallons and with various types of pouring openings, and various types of covers to meet practically every food product requirement, and all of these containers are available with special protective linings that will prevent contamination, discoloration, or any other injurious reaction to the product from the container.

In making up these sanitary barrels, this manufacturer uses nothing but the very best grade of steel which meets this specific requirement. If the steel does not comply with the very strict specifications applied, it is promptly rejected.

The specifications for steel for this purpose are very rigid and are so set up that they eliminate the various factors that might lead to some difficulties in producing steel containers from this steel. These specifications are, of course, based upon their experience in producing steel containers, during which time they have naturally learned to produce the finest grade of steel containers. This steel is shipped, carefully wrapped in waterproof covers and is delivered in a manner that prevents it from being exposed to the extent of discoloration of the steel or causing rust and corrosion.

A tremendously large stock of steel is carried at all times, so that large customer requirements may be handled promptly. In this way the manufacturer is never placed in the position of having to depend upon shipment from the steel market to complete orders, thus taking the chance of being forced to accept steel for use which does not come up to specifications, completely. Several hundred thousand dollars worth of steel is held on hand regularly by this company.

This steel, of course, is kept clean and dry at all times and undergoes a cleaning process and careful inspection before being made into containers for edible products, or for any product requiring a high degree of purity insofar as its container is concerned. When edible product containers are made up, they are thoroughly cleaned and the covers placed on the containers promptly so that a clean, sanitary interior is assured. Of course, those containers that are coated on the inside with the special protective lining are likewise cleaned and kept clean to insure a sanitary interior.

This manufacturer maintains a Chemical Research Department, which experiments constantly with various types of interior coating or protective linings, which will resist the reaction of practically every product. This department, of course, is operated entirely for the benefit of users and gladly works with customers or prospective customers in developing a protective lining that will be entirely satisfactory to them, and that thoroughly protects their products. For most products, the manufacturer has already established protective linings which have proven out by actual usage over a long period of time to be entirely satisfactory. Where the manufacturer does not have a protective lining that has proven to be satisfactory, they are in a position to develop one that will meet practically all requirements. Some customers have their own chemists who work with the manufacturers Chemical Research Department in connection with these protective linings. These linings are, of course, selected to prevent every type of contamination to the product. That is, linings which will not discolor the product, nor change its flavor or its odor, and which will prevent any possible reaction between the product and the container. All of these factors are obviously of paramount importance to the shipper. Of course, in addition to those with protective linings, containers of stainless steel, hot dipped galvanized, or tinned are also made. There are certain products, such as some types of fruit juices, etc., which require these special containers for satisfactory results. Of course, containers made of these special materials are made up on special orders.

However, the important factor in this connection is that the manufacturer is in a position to work out for the customer or prospect a container which will carry his product without altering the quality of the product in any way. Of course, it is an accepted fact that products shipped in steel containers have greater customer acceptance largely because the customer feels that if the product comes to him in a steel package, it is exactly as the manufacturer produced it, and that it has not been contaminated in any way.

Of course, steel packages also eliminate many of the losses resulting from careless handling of the containers in shipment and from shrinkage through seepage or leakage.

These factors, combined with the fact

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Packing Shortening

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that most steel containers, depending, of course, upon the product shipped in them, can be used over and over again, which makes the steel containers a matter of economy.

Mechanical Details of a Typical Sanitary Removable Head Steel Barrel

Now, concerning the mechanical details of these sanitary, removable head steel barrels: first of all, many products such as edible semi-solids, pastes, plastics, etc., are more practically and conveniently shipped and handled in full open head barrels, inasmuch as it is much easier to fill them, much easier to inspect them during filling, and much easier for the customer to remove the contents. Accordingly, these special barrels were developed.

The entire head of the barrel is removable so that there are absolutely no obstructions to interfere with filling or emptying. With the exception of the rolling hoops, there are no projections nor crevices into which the product contained can get, to make emptying difficult, and these rolling hoops are so constructed that they do not retain the product nor prevent complete removal. The cover of the barrel is so constructed that the edge projects out over the top rolled edge of the barrel itself. This construction has a very definite advantage in that any dirt or water which might collect on the top of the cover would not fall into the barrel and thus contaminate the contents as the lid is being removed.

A gasket of rubber, cork, or fibre, or practically any other material necessary to meet a specific product requirement, is attached to the underneath side of the cover to make a leakproof closure when the cover is sealed in place. These gaskets seat so securely against the top rolled edge of the barrel that when the lid is in place even without the sealing ring on, the product is kept fairly well protected.

Various types of sealing rings are offered, each having some particular advantage and each being preferred for certain types of products and by certain concerns. For example, one sealing ring offered has what is called a vertical action locking lever. This locking lever is so constructed that tremendous pressure can be exerted in pulling the ring tightly around the top of the barrel, firmly squeezing the gasket down between the top rolled edge of the barrel and the cover. This closure is so secure that even thin liquids are said to be shipped in this barrel without leakage.

The particular advantage of this type of sealing ring is that since the locking lever operates vertically, there is no chance of injury to the hands in opening or closing the barrel. The mechanism of this sealing ring is very simple—there is nothing to get out of order and nothing to require adjustment. An important factor of this ring, as well as an alternate that is offered which has a horizontal action sealing ring, is that the connecting arm which serves to pull the ends of the two sealing rings together is so arranged that it can be unhooked leaving each end of the ring free. The advantage of this type of construction is that, should the barrel receive unusually hard handling in transit so that the rings are damaged in any way, they will not "jam" nor "stick," but can be removed without difficulty. Where the ring has been damaged in handling the barrel, it is only necessary to unhook the connecting arm and then simply remove the ring from the top of the barrel by unwinding it.

This ring has a horizontal action locking lever, which moves horizontally across the top of the barrel in drawing the ring tightly around the top of the barrel. It is preferred by some shippers for various reasons, one of which is that they believe that a little less effort is required to exert the same amount of pressure upon the sealing ring, although, with either ring, a sufficient amount of effort is required to make a perfectly leakproof closure. This type of sealing ring is also simple in construction with no parts to break or to get out of order, or require adjustment. This ring also has a connecting arm which can be unhooked leaving both ends of the ring free.

There is another type of sealing ring offered. It does not have the locking lever, but the two ends of the sealing rings are pulled together by a substantial bolt. A closing machine is furnished to users of barrels equipped with this bolted sealing ring, so that the ring is pulled very tightly around the top of the barrel with this closing machine, and then the bolt is put in place and tightened. This type of sealing ring is a little less costly than the other types and, of course, is not quite as convenient to open and close, although it does make a very sturdy practical closure.

In case of the first two sealing rings described, the locking lever is made so that it may be sealed with a wire car seal or a padlock. This has two advantages—most important of which is that the product may be packed in this barrel, sealed up, and the closure locked so that the package is tamper-proof during delivery to the customers. It also provides for the customers being able to lock up any part of the unused contents to prevent pilferage or the chance of unintentional contamination in their own plant.

Some users simply put a small bolt through the holes that are provided for sealing the lever in closed position so that the barrels may not be easily opened and in order to prevent any chance of their coming open in transit. Of course, these sealing rings are equipped with lugs which hold the locking levers in closed position and there is very little chance of the ring opening up in handling; although the fact that they may be locked or sealed in closed position, provides an additional safeguard that is regarded by some users as a distinct advantage.

Additional Data

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storage. The numbers along the upper curve represent the number of samples averaged for that particular section of the curve. This curve shows in a different way the sudden increase in the hazard of storing seed of moisture content in excess of 12.5%.

It must be borne in mind in considering these results that they are derived by averaging the data for a fairly large number of samples. In each group, as is shown in the table, the individual samples show a wide range of differences in their behavior during storage. One sample, for example, of 13.0% moisture content, may keep fairly well for a considerable period, while another, say of 12.0% moisture content, may deteriorate rapidly under the same conditions. Other factors besides the moisture content enter into this question, but we do not now know as yet what they are.

The observations made on seed storage during the 1933 season lead us to believe that it may be possible to better control the storage of seed. It was noted that throughout the season, in spite of the great amount of blowing or air cooling to which the seed had been subjected, there was no diminution in the moisture content of the seed. It is not possible to materially dry several thousand tons of seed either by blowing or sucking air through them. The only thing that can be accomplished is to keep the seed as cool as the outside temperature will allow.

As a preliminary effort to derive some useful benefit from the information obtained, a survey was made of possible methods of rapidly estimating the moisture content of seed, such as might be made by an untrained man in an oil mill. If sufficiently rapid, such a method might be useful in determining where seed should best be stored; or, in case the method should not be rapid enough for use during unloading, it could serve, when applied to seed already stored, as a convenient index as to what seed should first be crushed.

Indications are that a method utilizing a relatively simple apparatus and employing vacuum drying at 125-140° C will yield fairly accurate values in about one hour's time. It is evident from the data that accuracy of result is not of first importance in this problem. Rather should simplicity of manipulation and speed be sought. It would, in fact, be sufficient to indicate whether the seed in question contained in excess of 12.5% moisture, or between 10% and 12.5% moisture, or less than 10%. This particular phase of the investigation is still in progress, and it is expected that a positive report will be made on it at next year's meeting of this Society.

Houston, Texas
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