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**NATIONAL ASSOCIATION
of
COST ACCOUNTANTS**



Official Publications

Vol. II

JUNE, 1921

No. 14

**Cost Accounting for Fruit
and Vegetable Cannery**

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

NATIONAL ASSOCIATION
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Cost Accounting for Fruit and Vegetable Canners'

FRANK PALMER BROWN,
Pratt-Low Preserving Co.,
Santa Clara, Cal.

BUSH TERMINAL BUILDING
130 WEST 42ND STREET, NEW YORK CITY

The National Association of Cost Accountants does not stand sponsor for views expressed by the writers of articles issued as Publications. The object of the Official Publications of the Association is to place before the members ideas which it is hoped may prove interesting and suggestive. The articles will cover a wide range of subjects and present many different viewpoints. It is not intended that they shall reflect the particular ideas of any individual or group. Constructive comments on any of the Publications will be welcome.



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NATIONAL ASSOCIATION OF
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National Association of Cost Accountants

COST ACCOUNTING FOR FRUIT AND VEGETABLE CANNERS

The cost problem of the canner who is handling only one product is comparatively simple and even when two or more products are handled in the same factory at different seasons of the year, it is possible to establish accurate costs without much difficulty if due diligence is maintained in keeping the records of the different commodities distinctly separate. It is when a considerable number of different products are packed simultaneously in a variety of containers involving several grades that the problem of determining the actual costs becomes exceedingly complex.

The National Canners' Association has adopted a very workable system of cost accounting suitable for those canners who handle only one product. They have also adopted a system for canners handling more than one product which is applicable in many cases.*

While there are certain basic principles which are applicable to all methods of establishing costs whether the canner is handling only one commodity or several, it is nevertheless true that many canners who handle a variety of products encounter cost problems which are more or less peculiar to their own operations. It is with the cost problems of the latter that this paper will deal. There is such a wide divergence of opinion among those familiar with the canning industry as to the best methods to pursue in establishing certain elements of canning costs that it is too much to expect that every reader will agree with the opinions advanced. It is hoped, however, that some of the ideas presented may be found suggestive.

As in other lines of business, there are two phases or divisions of cost accounting for canners. The first is concerned with finding the actual costs for the season that is finished, while the second embraces the problem of estimating future costs. Practically all canned fruits and vegetables are sold "future," and it is therefore necessary for the canner to establish his pasts costs as accurately as possible in order that he may have a sound basis upon which to base his estimates.

The elements of direct expense entering into the cost of canned

*Reference to these systems is made in an appendix to this article, see page 3.

fruits and vegetables are cans, green product, sugar, fuel for cooking, cases and nails, labels, factory labor and warehouse labor.

Assume for the purpose of illustration that a comparatively large canner has had a busy season and that he has packed eight or ten varieties of fruit and three or four varieties of vegetables within a period of four or five months. Hundreds of tons of fruits and vegetables have been handled. At times as many as five or six varieties have gone through the factory at the same time. The raw product was perishable and had to be handled with the least delay possible. His force of employees jumped almost overnight from twenty or twenty-five people to several hundred. Both the factory and office organizations had to expand rapidly in order to take care of the rush and, while under such circumstances it might be possible in a measure to work up cost data as the pack progresses, it is much more desirable to gather only such information as is absolutely necessary while the packing season is on, and then in the winter months after the season is over to work up the costs at a period when there is more opportunity to give careful thought to the various problems involved. Furthermore, this plan permits the canner to maintain an adequate nucleus of his office and factory organization throughout the year which is decidedly more sensible and practical than to break in a new organization each year. Then again it is practically impossible to secure certain vital information until the season is over. The pack figures must be verified, green fruit costs finally established, various wastes determined, and other information checked up.

At the end of the season, when the pack is completed, an inventory is taken and the stock records, obtained from the daily count of the pack, are corrected. A list of the pack in the various grades and sizes of cans is then made up. Suppose the pack amounts in round numbers to 500,000 cases, made up of six or seven different sizes of cans with a varying number of cans to the case. If the pack were made in California, there would be six different grades in each variety of fruit and from two to three grades in each variety of vegetables.

Having determined the actual pack, detail cost sheets should then be made up. These sheets should be arranged in columnar form, a column being provided for each item of the pack. It is also advisable to keep all packages of a variety together and to arrange them according to size and grade. At the left of the cost sheets the various items of cost which enter into the individual packages should be listed, each item occupying a line. Inasmuch as canned goods are usually quoted on the basis of a dozen cans, it is quite essential that costs be figured on this same basis, due caution being taken to carry the decimals out far enough. Three or four places are usually sufficient for all practical purposes.

CANS

The cost of cans, being the first item of direct expense, should then be calculated. The total number of each size of cans purchased should be ascertained, together with the total cost of each size including freight in, and from this information the cost per dozen figured for each size. Similarly, the totals of the actual pack by sizes should be ascertained. Inasmuch as there are always some cans wasted through smashing in process, poor sealing, or some similar cause, it was necessary to determine the tons from this source. This is done by comparing the cans used with the good cans actually packed. The waste for each size should be determined on a percentage basis, and the net unit costs increased to take care of such waste.

GREEN PRODUCT

The distribution of the cost of green product involves a number of calculations. It is first necessary to ascertain the total quantities of the different fruits and vegetables paid for and used together with the total cost of each variety including the cost of buying and the inward freight. The next step is to find the average cost per ton of each variety. However, when this has been done there still remains the more intricate problem of determining the actual quantities of fruit used for each different size of can including the "waste in working" such as pits, skins, etc. If only one size of container were used, this problem would be very simple, but where several containers of varying sizes are used it is necessary to reduce the pack to a common denominator. This common denominator for the sake of simplicity, should be the unit most commonly packed and inasmuch as with fruits the No. 2½ size can is the package most generally used, this size would seem to be the logical unit to use as a base. Furthermore, as before stated, inasmuch as canned goods are always quoted and sold by the dozen, it is very desirable and convenient to establish as a base, a dozen cans of the common size.

After determining the size of can to be used as a base, the entire pack should be extended in dozens of cans and reduced to the common denominator previously decided upon. If the No. 2½ can is used as a base, the relationship of each of the other sizes of cans to the No. 2½ can should then be determined. This relation should vary approximately with the content of the can, certain other conditions being taken into consideration such as the net weight of packing for the different grades.

In reducing the pack to terms of No. 2½ dozens, the various grades of each variety of fruit and vegetable should be kept separate and the pack recapitulated by variety and grade so as to

show the number of No. 2½ dozens of each grade of each variety together with the grand total of No. 2½ dozens of each variety.*

The next step is to divide the total number of pounds of each variety of fruit by the number of No. 2½ dozens of each variety, the result being the number of pounds of fruit used per No. 2½ dozen cans. The amount of fruit required per No. 2½ dozen will vary greatly with the variety packed.

The average price paid per ton for fruit and also the amount required per No. 2½ dozen cans for each variety has now been determined. If there were only one grade of fruit packed, the cost of the raw product would be easily established. However, inasmuch as several grades are usually packed, the cost of the fruit must be "spread" over the different grades, the higher grades naturally taking a higher price than the lower grades.

In California there are five different grades of fruit packed—namely, fancy, choice, standard, seconds in sugar and seconds in water, and pie. The very best fruit is used in the fancy grade. The choice grade fruit is very good but usually smaller and perhaps not of as high color. The standard grade is about average, while the second grade is packed from fruit that is distinctly substandard. The pie is the soft, off-grade fruit that cannot be used in the other grades. The fancy fruit is worth distinctly more than the average while the pie is worth considerably less.

When apportioning the cost of fruit to grade, the percentages of the various grades of each variety should first be determined from the recapitulation sheet of No. 2½ dozens of each variety previously referred to.† The cost of the fruit should then be apportioned to each grade of each variety in such a way that the respective percentages of grades of a variety multiplied by the corresponding grade costs per ton, will equal the average cost per

*FIGURE ONE

Fruits	Pack in Terms of No. 2½ Dozens						Total
	Fancy	Choice	Standard	Second	Water	Pie	
Apricots	10,000	15,000	50,000	10,000	5,000	10,000	100,000
Pears	5,000	10,000	25,000	5,000	2,500	2,500	50,000
Yellow Cling Peaches...	50,000	100,000	200,000	50,000	25,000	75,000	500,000
Yellow Free Peaches ..	10,000	20,000	40,000	10,000	5,000	15,000	100,000
Plums	1,000	2,000	4,000	1,000	500	1,500	10,000
Cherries	5,000	15,000	25,000	2,000	1,000	2,000	50,000

†FIGURE TWO

Fruits	Pack-Percentages of Grades of Each Variety Figured from Pack in Terms of 2½ Dozens						Total
	Fancy	Choice	Standard	Second	Water	Pie	
Apricots	10.00	15.00	50.00	10.00	5.00	10.00	100.00
Pears	10.00	20.00	50.00	10.00	5.00	5.00	100.00
Yellow Cling Peaches ..	10.00	20.00	40.00	10.00	5.00	15.00	100.00
Yellow Free Peaches....	10.00	20.00	40.00	10.00	5.00	15.00	100.00
Plums	10.00	20.00	40.00	10.00	5.00	15.00	100.00
Cherries	10.00	30.00	50.00	40.00	2.00	4.00	100.00

In actual practice the figures in Figure 1 will be odd numbers; and the percentages in Figure 2 will be odd figures. The latter should be carried out two decimal places, the total of each variety always equaling 100% as indicated in Figure 2.

ton of that variety. This apportionment of fruit cost per grade requires rather accurate information as to conditions and values. Some set rules may be applied, but generally it is possible to effect a "spread" of prices that will not be out of proportion to the selling value of the respective grades of fruit and vegetables.

As a general thing the difference between the prices per ton of the fruit for the various grades should not be too great. On the average it should not be more than 10% of the base or average cost per ton or per pound, although this may vary somewhat. Pie fruit, being distinctly off-grade fruit, should accordingly be priced at a low figure since this grade is in the nature of a by-product. Market conditions for canned pie fruit will govern to a large extent the price which can be set on the green fruit for this grade of the canned product.

Having determined the price per ton for each grade of fruit, it is comparatively a simple matter to arrive at the cost per No. 2½ dozen cans for each grade. This is done by multiplying the number of pounds used per No. 2½ dozen by the cost per pound of the respective grades. The cost of fruit for other sizes of cans may be found by using the same table of relationships as was used in reducing the pack to terms of No. 2½ dozens.

SUGAR

Sugar is added to the fruit in the form of syrup, the degree of sweetness varying with the different grades. It is first necessary to establish a schedule* showing the quantity of sugar required for each grade and variety, and for each size of can. Such a schedule should be worked up with considerable care and should be based on tests made under actual working conditions. There is considerable variation in the quantity of syrup and hence of sugar required for the different varieties of fruit in the same grade when the same degree of syrup is used, even when the net packing weights of the different varieties are the same. Again some varieties of fruit naturally contain a higher sugar content than others and a lighter syrup is used on such varieties. The quantity of syrup will also vary with the net packing weight per can of the fruit, there being considerable variation in this respect among the different varieties. All of these conditions must be taken into consideration when making up a sugar schedule, and it is therefore very essential that the schedule should be based on practical experience. When taking tests for the purpose of establishing such a schedule, it will only be necessary to use one size of can, the other sizes varying in proportion to the net contents of the can as determined in the

*The word "schedule" as used in this article means a predetermined ideal measure of quantity or cost of the particular element of cost being discussed. All such schedules, however, should be based on actual tests or results of operations.

schedule of relationships used in arriving at costs for the green product.

Having once established a satisfactory schedule, there should be little change from year to year as long as the packing weights for the fruits are not changed. It must be borne in mind, however, that the schedule, considers only the sugar in the syrup actually required to fill the cans to a certain height after they have been filled with fruit at a certain packing weight. There is always some waste, which must be taken into consideration when figuring the cost of sugar for the different packages.

As the unit for figuring canned fruit costs is one dozen cans, the schedule should be worked out on that basis. The pack at the end of the period or season should be extended on the sugar schedule and the total compared with the sugar actually paid for and used. The difference between the amount actually used and the pack extended on the basis of scheduled figures represents the waste which should be figured on a percentage basis and added to the cost per pound of the sugar used.

The cost of sugar for the individual packages is then easily obtained by multiplying the number of pounds of sugar required for each dozen cans according to the schedule by the final cost of the sugar per pound including the cost of sugar wasted. The total cost of sugar is accordingly spread over the whole pack in the most equitable manner possible and the cost figures are tied up absolutely with the financial records. As sugar is one of the principal items of expense it is very essential that considerable care be given to this element of the cost of canned fruit. Since sugar is not used to any extent in canning vegetables, this item need not be considered insofar as they are concerned.

FUEL

Some concerns treat fuel as a general or indirect expense and make no attempt to distribute this item as a direct element of cost. However, inasmuch as the amount of fuel required for the various packages varies considerably in accordance with the length of cook required, it is quite proper to treat this element of cost as a direct item of expense.

In establishing fuel costs, two elements should be taken into consideration, fuel for power and incidental purposes, and fuel for cooking. The proportion of fuel used for power is relatively small and each dozen cans packed should bear a fixed proportion of this part of the fuel cost. On the other hand the cost of fuel used for cooking should vary with the length and character of the cook required. It is possible through careful study of conditions to work out a schedule concerning both elements of fuel cost which

will be exceedingly accurate, and while there is bound to be some element of uncertainty involved, such a schedule represents the facts as nearly as it is practically possible to establish them.

As with sugar, this schedule should be worked out on the basis of one dozen cans. If oil is used the schedule should be expressed in gallons of oil per dozen cans. If coal be the fuel used, then the schedule may be worked out in pounds of coal per dozen cans. The pack should then be extended on this schedule, the "waste" determined and added to the unit cost, and the cost for this item in the individual packages determined as in the case of sugar. Here again, the individual costs are tied up with the total actual costs.

DIRECT FACTORY LABOR

In fruit and vegetable cost accounting, without doubt, the most difficult individual element to determine accurately is factory labor, especially where a factory is working on several different kinds of fruit at the same time. Some concerns have endeavored to keep an actual check on the labor of each variety but on account of the migratory type of help and also because canneries are in operation for only a comparatively small portion of the year, it is exceedingly difficult to keep trained help for this class of work. Even at the best a certain amount of estimating must be done where this method is attempted. Anyone who is at all familiar with the working conditions in the larger factories realizes that the uncertain human equation enters very decidedly into this plan of determining labor costs, and that under identical conditions two different people will arrive at very different results.

There are other concerns who use the schedule method of arriving at factory labor costs and this method will be outlined briefly. During the course of a fruit season, there are usually certain days when straight runs of fruit of each variety packed are made. When such is the case, costs can be established for such varieties on those straight days with a very fair degree of accuracy. However, the packing costs on such days, from the very reason that the pack is made up of one or mostly of one variety, are usually below the costs on the days when several varieties are handled. The ideal way, would be to run one variety on one day, another variety on the next day, and so on throughout the season. It is not possible to do this however because fruit must be handled when it is received. The additional cost which results from having to run several varieties on the same day should be shared by each variety proportionately on the basis of the cost of packing each variety in straight runs.

A schedule of labor costs based on straight runs should be made up from the results of those runs and the pack extended on this schedule. The difference between the amount actually spent

for direct factory labor and the pack extended on the schedule should be spread over the schedule on a percentage basis. If the bases for establishing the schedule are fair in the first place, then each variety should share in the overage proportionately.

The data on which such a labor schedule is based should be very carefully compiled. Daily labor reports showing sub-divisions of labor as the fruit passes through the various processes should be kept and carefully watched. The cost for some of the processes varies in direct proportion to the quantity of fruit handled. For other processes the cost varies in proportion to the number of cans handled. It is very essential that the cost of male labor be kept distinct from the cost of female labor in the different processes as the rate of pay is usually higher for the men, and any change in the rates of pay for either would have to be taken into consideration when revising the labor schedule for the purpose of making forecasts. As most of the male help is common labor, the rate of pay to all men employed is usually about the same. This is also true of the rate of pay for the women. Piece work rates are also uniform in the different processes. The results of a change in the rate of pay for either men or women may be calculated very closely when the labor schedule is built up in sections, corresponding to the various processes through which the product passes in the factory.

It is possible in this way to arrive at the labor cost of any package very accurately by a simple and reliable method based on the actual results of operation. It is necessary however to revise the bases continuously in order to take care of changing conditions and to check the schedule as a whole with actual total costs to determine the average necessary to add to each individual package.

CASES

The direct factory labor cost covers the labor expense from the time the raw product is received until the filled cans, sealed and cooked, are stacked, unlabeled, in the warehouse. At this point there is a change in the basis on which the costs for the season or year are figured. Up to this point the costs have dealt with the pack of a single season and the various items of expense have been spread over the pack alone. After the cans are stacked in the warehouse, however, the expenses are based on the total shipments for the year, rather than on the pack, as the carryover at both ends of the year must be taken into consideration, because it is very seldom that a canner who makes a sizeable pack finds his warehouse clean at the end of his fiscal year.

Ordinarily, canned goods are not labeled until the goods are ordered shipped and consequently when figuring the cost of cases or labels, such costs should be based on total shipments. A record

should be kept of all cases purchased, by size, and the total cost of each size determined, including carryover at the beginning and allowing for carryover at the end of the year. From this record, the average cost of each size of case should be figured. The cost of nails per case should also be determined. The stock records, if properly kept, will show the actual shipments made for each size. The number of cases purchased should then be compared with the shipments and the waste determined, for there is bound to be some waste on account of poor shoo. This waste should be figured as a percentage and added to the net cost of the cases. This cost is then refigured on a per dozen basis for the different sizes of cans and included as an item of direct cost of the individual packages.

LABELS

The total cost of labels varies with the shipments. Labels are purchased by the thousand and there is usually considerable variation in the cost for the different grades. The most representative label for each grade should be selected as a base for that grade and the cost per dozen for each size of can determined. The total shipments by size and grade should then be ascertained from the stock shipment records, expressed in dozens, and extended at the base cost per dozen for each grade and size. The total should then be compared with the actual cost and the final unit cost corrected in accordance with the result obtained. There should not be much waste but when large quantities of labels are handled the loss through error, unless accounted for, might be considerable in the aggregate.

WAREHOUSE LABOR

Warehouse labor is entirely distinct from factory labor and should be treated as a separate element of direct cost. The total amount of this item varies with the actual shipments whereas factory labor varies with the pack of a single year which may or may not be the same as the shipments.

As with factory labor, however, this element of expense may be readily calculated by means of a schedule based on actual working conditions embracing such items as the cost of printing and making cases, labeling cans, casing, loading cars, etc., with certain additions to each size and grade for general warehouse expense. The shipments extended at the predetermined schedule should be compared with actual warehouse labor costs for the period under review and the unit cost per dozen corrected accordingly. Figuring the costs in this way also serves as an indication of the efficiency with which the warehouse is being run, and comparisons may be made between different years or between the results obtained by different branches, if a concern is operating more than one factory.

INDIRECT OR GENERAL EXPENSE

Indirect expense is divided into factory and general. Included in factory indirect expense are such items as maintenance, depreciation, light, general factory materials, salaries of superintendents, insurance and any miscellaneous expense directly connected with the factory end which cannot be treated as direct expenses. When figuring past costs the factory indirect expense should be treated separately from general business or administrative and sales cost, and the expenses entering into this portion of the cost should be apportioned over the individual items on the basis of the cost of the pack. In arriving at the total percentage which should be added to direct cost to cover indirect factory expense the various items which make up indirect factory expense should be kept separate and the percentages of each item to the total factory cost should be figured separately, the sum of the ratios making up the total rate to be applied to the direct cost of the individual packages.

After factory indirect expense has been figured there is still left the general indirect or administrative expense. This is again divided into manufacturing and sales expense. Included in manufacturing administrative expense are such items as officers' salaries, except sales manager, interest, etc. Sales expense includes the usual items under this classification. These two divisions may be combined, however, and added to the cost of the individual packages at one operation, the percentage used being the relation of the whole amount of such expenses to the total cost of sales. As with factory indirect expense, the percentages of the individual items making up administrative expense should be figured separately, the total of these ratios being the percentage used in figuring the general indirect expense on the individual packages.

The method of establishing costs for fruits and vegetables outlined in this paper has been in successful use for a number of years but is being constantly improved from time to time as new light is thrown on the various problems involved. While necessarily there is a certain element of individual judgment and estimating involved, it is reduced to the minimum and in all instances the costs are tied in with the financial records.

ESTIMATING FUTURE COSTS

Having established sound bases for past costs, the task of estimating future costs becomes a comparatively simple process. As soon as contracts have been made covering the various elements of direct cost involved, each of these items should be taken up in turn and the probable wastes and yields determined. In making these estimates of wastes and yields the results of previous years should be very carefully studied before deciding on the figures to

be used in forecasting future costs.* In making the study of past records, the results of the most recent years should be given the greater consideration. Where the cost of freight in is a material item of expense such cost should be added to the contract price of the items involved before the unit estimate of cost is figured.

The percentage to be added to the direct expense to cover general or indirect expense will vary materially with the amount of business done, but inasmuch as this cannot be definitely determined in advance, the results of previous years must be taken as a guide, making such allowances as seem necessary. For convenience in estimating, it is usually desirable to lump all indirect expenses, including factory, manufacturing administrative and sales expense into one item, and to apply this to the direct estimates at one operation.

In conclusion it may be said that the primary consideration, in a cost system for canners, is the establishment of sound bases through an analysis of past costs. With these as a foundation, combined with careful judgment, estimates of future costs should be very accurate and should at the end of the year show very little variation from actual costs, which after all is the ultimate test of any cost finding system.

The second uniform system of the National Canners' Association (p. 71) referred to in the appendix to this article contains the following reference bearing on this point:

"In view of the uncertainty of crops, and because a short crop increases the unit cost of Factory and General Overhead Expense and Seed Loss, it is good business judgment and sound accounting practice for the canner to establish a Reserve in the years of abnormal production to equalize the excessive overhead cost in years of sub-normal production.

If the actual pack equals the average pack, no provision should be made for Crop Insurance, if the actual pack is greater than the average pack, a Reserve should be set up, and if the actual pack is less than the average pack, the Reserve created in years of abnormal pack will be drawn upon to reduce overhead expense to normal."

APPENDIX

NATIONAL CANNERS' ASSOCIATION

Uniform Cost Systems

The two uniform cost systems which have been adopted by the National Canners' Association are explained in two Bulletins of the Association—Special Bulletin No. 2 (December, 1917), A Classification of Accounts for Canners who manufacture one line of canned goods at one factory only and Special Bulletin No. 3 (January, 1920), A Classification of Accounts for Canners who manufacture two or more lines of canned goods or operate two or more factories.

Special Bulletin No. 2 is a booklet of thirty-three pages, 6 x 9. As the name implies, this booklet is chiefly devoted to the presentation of a code of accounts with rather detailed information as to the debits and credits which should be made to each account. There are ten major groups of accounts with numerous subdivisions under each. The major classes are: 1. Investment, 2. Depreciation reserve, 3. Capital, 4. Direct Manufacturing cost, 5. Indirect or overhead expenses, 6. Income, 7. Income deductions, 8. Stock, supplies and finished goods, 9. Miscellaneous, and 10. Farm. Complete instructions for closing the books are also given.

A sample manufacturing and income account (statement) and a sample balance sheet with hypothetical figures are shown. The former shows average costs per dozen on each cost item. There is also a chart showing the relationship and disposition of the items that make up the Manufacturing and Trading Accounts. A comprehensive index to the accounts and the items to be charged or credited is also included.

In a section devoted to miscellaneous comments there is a table of depreciation rates taken from a report of the New York Canners' Association.

Special Bulletin No. 3 contains eighty pages of the same size. The system presented was originally adopted in December, 1917, and revised in January, 1920, on the basis of experience gained from the operation of the system during the interval.

The arrangement of the subject matter of Bulletin No. 3 is much the same as in Bulletin No. 2. More elaborate instructions for closing the books are given in No. 3. These instructions include an illustrative pre-closing trial balance and closing journal entries with actual figures. The entries are arranged in logical sequence with appropriate explanations after each entry. The usual financial statements and supplementary schedules with figures are also shown. Fifty-three pages are devoted to the code of accounts and the financial statements.

There are a number of notes on miscellaneous topics, such as: 1. The books necessary to run the system, 2. Accounting for by-products, 3. Farm accounts, which are handled as if this phase of the canner's business were a separate and distinct enterprise, 4. Treatment of seed accounts, 5. Quantity of saleable canned goods produced, 6. Distribution of certain accounts among the factory expense accounts according to relative number of cans of each commodity packed, 7. Depreciation rates, 8. Pricing inventory, 9. Interest on investment, 10. Crop insurance.

Bulletin No. 3 is indexed, according to the major classes of accounts; according to the alphabetical arrangement of accounts; and according to sequence of numbers for the accounts. It is also rather fully cross-indexed.

In both bulletins it is pointed out that the systems outlined are not intended to be followed blindly in all cases. They indicate a sound basis of procedure which must be adapted to each individual case with due consideration for local conditions. In both bulletins standard books for the operation of the system are recommended.

The two systems are arranged in such a way that manufacturers following the system of Bulletin No. 2 and those following No. 3 may intelligently compare their costs in cases where they manufacture the same lines of product.

To some extent, Mr. Brown's article and these uniform systems supplement one another as indicated above, the systems are devoted chiefly to outlining the actual technique of cannery accounting. There is not much reference to general principles. Mr. Brown's article deals chiefly with one phase of the subject—manufacturing costs with particular reference to fundamental principles rather than accounting technique. It is rather interesting to note that there are no serious inconsistencies or differences of opinion in these two treatments of the subject, although they are written from entirely different angles and with different objects in view.

Vol. I

- No. 1—**Organization and Objects** (replaced by Vol. II, No. 2)
- No. 2—**Constitution and By-Laws** (replaced by Vol. II, No. 1)
- No. 3—**Calculation and Application of Departmental Burden Rates**, *Research Dept. N. A. C. A.* (out of print)
- No. 4—**Overhead Distribution, Compilation and Presentation**, *Research Dept. N. A. C. A.* (out of print)
- No. 5—**Industrial Accounting as an Aid to Management**, *Homer N. Sweet* (out of print)
- No. 6—**Distribution of Defective and Spoiled Material Costs**, *C. H. Smith* (out of print)
- No. 7—**Accounting for By-Products**, *Research Dept. N. A. C. A.*
- No. 8—**Foundry Costs**, *J. P. Jordan*

Vol. II

- No. 1—**Revised Constitution and By-Laws**
- No. 2—**Organization and Objects**
- No. 3—**Cost Accounting for Brass and Bronze Foundries**, *A. H. Barrett*
- No. 4—**Chapter Organization**
- No. 5—**Managerial Uses of Foundry Costs**, *J. P. Jordan*
- No. 6—**A Method of Obtaining Ink Costs in the Printing Industry**, *Paul H. Shaw*
- No. 7—**Purchase Orders and Purchase Records**, *Homer N. Sweet*
- No. 8—**Some Problems in the Actual Installation of Cost Systems**, *H. G. Crockett* (out of print)
- No. 9—**Cost Accounting for Public Utilities**, *E. D. Bistline* (out of print)
- No. 10—**A Bibliography of Cost Books**, *Research Dept. N. A. C. A.*
- No. 11—**Cattle Costs**, *E. D. Newman*
- No. 12—**Coöperation and Cost Control**, *John W. Robinson*
- No. 13—**A Method of Accounting for Scrap**, *C. B. Williams*
- No. 14—**Cost Accounting for Fruit and Vegetable Cannerys**, *Frank Palmer Brown*

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