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THE use of the budget in industry and commerce as a device for the assistance of management is a relatively modern development. Even today its value is not generally recognized. Budget preparation demands consideration and planning for the future, yet if the use of budgets served no purpose other than to provide more planning, it would have served a worth-while purpose. Budgets and budgetary control are applicable in some form to the activities of most enterprises and, where the nature of the operations is such as to make impracticable the preparation of a budget in the ordinary sense, it usually will be found possible and practicable to devise methods which will accomplish a comparable purpose.

There are phases of the dairy industry in which the difficulties of applying budgetary control are considerable, and to accomplish the desired end it becomes necessary to adopt methods which, while appearing to be wholly different from budgetary control as usually understood, will involve valuable planning and will be found to accomplish one of the most important purposes of ordinary budgetary control, that is, operating efficiency.

While it might be appropriate, as an introduction, to consider budgets and budgetary control in general, the principal purpose of this article will be to suggest means which may be employed to meet particular production-cost problems that arise in the dairy industry. Accordingly, the considerations will be restricted to budgets in relation to expenses and costs.

Expense budgets relate to all those expenses and costs incident to the administration of an enterprise and to the production and distribution of its products or services. Such expenses and costs fall into one of the three broad classifications of: (1) administrative and general expenses, including those general expenses relating to sales promotion; (2) direct selling costs; and (3) production costs. They may be classified as to:

(a) Budgets based on proposed expenses and directed towards limiting the expenses to be incurred, and
(b) Budgets based on planned performance and directed towards measuring the efficiency with which production and other activities are carried out.

The extent of personal services, rented space, advertising, other professional services, and all of the other services and supplies which normally will be required during an ensuing period for the general administration of an enterprise and the promotion of its business may be estimated and valued with considerable accuracy. As such expenditures, within limits, do not fluctuate in accord with normal changes in sales volume or price, the estimates when made may be employed with benefit for the purpose of limiting the expenses actually to be incurred. However, abnormal changes in sales volume and other unanticipated contingencies will have a bearing upon the extent of some of the personal and other services to be required. Consequently, it is not conducive to true economy or

NOTE.—An address read before the Controllers' Council of the International Association of Milk Dealers.

efficiency to consider the budget of such expenses either as authorizing the expenditure of the full amounts estimated or, on the other hand, as fixing the estimates as unchangeable limits. Nevertheless, such a budget constitutes a valuable control as it leads to appropriate inquiry into the cause of, and enables a requirement for the justification of, any variation from the considered and approved estimates.

In the case of production or manufacturing costs, the situation is quite different. Here the amounts which must be expended for materials, supplies, and services will be generally directly proportionate to the quantities to be produced and marketed, and the cost of materials will usually fluctuate in proportion to selling prices. The amounts to be expended are secondary in importance to the related quantity and the unit cost of production. Accordingly, any budget of such expenditures, stated in terms of the character and extent of materials and services to be required, must be based upon forecasts of the quantities of products to be manufactured and marketed.

Production enterprises may be grouped roughly into two classes. First, there are those in which it is practicable to plan definitely the amount to be produced during a season or other period, any variation between the planned production and the sales being cared for by inventory fluctuations. Illustrations of such cases embrace manufacturers of machinery, furniture, clothing, and other articles which are staples or may be produced against sales contracts and include some dairy production operations. In such enterprises, the quantity to be produced having been determined, the amount of labor, raw materials, supplies, and other expenses required by production operations during a period necessary to manufacture the planned quantity may be forecast in the same general way as in the case of general expenses, though with less assurance of accuracy. While estimates so made are not practical for use as fixed limits, because conditions which must be met may change from day to day, they make possible weekly or monthly comparisons between planned expenses and production on the one hand and actual expenses and production on the other. Such comparisons become a valuable control of efficiency, as variations between planned performance and actual performance are developed quickly, lead to inquiry into their causes, and enable the immediate institution of corrective measures.

In these enterprises in which the amount of product to be manufactured during a future period may be planned, the practicability of forecasting or planning the quantities and costs of raw materials, labor, and other expenses which should be necessary should be clear. Similarly clear should be the value of the control which becomes possible. In fact, any manufacturing enterprise which is able to plan reasonably its future production and does not do so, thus losing the opportunity to compare actual with planned costs and to inquire quickly into the causes of variation, is failing to take advantage of one of the simplest and most valuable of the several varieties of budgetary control.

The second class of enterprise, in which dairy production units usually fall, is one in which the production cannot be planned with reasonable accuracy. Such enterprises are those in which the products are perishable and must be manufactured to meet a fluctuating, day-to-day sales demand, or, while the products are staple, there will be fluctuations from day to day in the quantities of raw materials received and requiring to be immediately processed. The majority of dairy product manufacturers are faced, due to one or both of these circumstances, with this problem of variation of production rate due to uncontrollable factors.

The simplest dairy manufacturing unit is a creamery producing butter alone. In such a plant it must process currently all the raw material offered to it by its regular patrons with resultant fluctuation in daily production. On the other hand, it may be required from time to time to go outside of its normal sources to obtain the additional raw material necessary to meet an unexpected sales demand. As such factors result in uncontrollable fluctuations in the quantities of raw product to be purchased, and as the simplicity of the operation enables other expenses to be controlled better by visual supervision than by forecasting objective limiting amounts, the situation is one in which there appears to be little opportunity or requirement for the use of budgetary control. An exception would be the plant which is one of many in a large company, in which case a means of centralized control becomes desirable.

In larger plants which may produce butter, sweet cream, casein, dry milk, condensed milk, and possibly other products, the problem becomes complex. The day-to-day production in such a plant is affected not only by the quantity of raw material received each day for processing, but by the varying demands and varying market prices for its different products, which will necessitate, if the greatest value is to be obtained from the raw product, frequent and often daily change in the relative quantities of each product to be made. At certain times a demand or price may require a larger proportion of the raw material to be processed into sweet cream than at others. A change in the demand or price for condensed milk may increase or decrease the quantity of raw material to be directed into that product. In such a plant it becomes impracticable to forecast with reasonable accuracy the amounts of each product to be manufactured during any future period, or the amounts of the processing expenses.

In the first case, the extreme simplicity of the operations usually eliminates any particular requirement for expense control other than that best afforded by direct day-to-day supervision. In the second case, the difficulty of forecasting or planning the expenses is so great and the dependability of any expense forecast, regardless of how carefully prepared, would be so slight as to indicate clear impracticability. However, in the more complex operation the advantages of budgetary control are so great as to warrant serious inquiry as to whether or not it is possible to devise a form of planning or budgetary control by some means other than the use of a basic expenditure budget. It is believed that this is possible and that "standard costs" provide a method by which a valuable form of budgetary control can be accomplished. Further, it is believed that there will be other advantages of standard costs making them desirable for use in the dairy industry even in simple operations.

While so-called standard costs as a medium of cost accounting should be generally understood, a brief description may be desirable. In factories producing a diversity of products or equipment items built up from many parts, the direct segregation of the various components of raw material, labor, power, fixed charges, and other costs among the various articles or parts manufactured is excessively costly, of dubious accuracy, and often wholly impracticable. In such enterprises a normal or ideal cost of each article or each part is determined or estimated by computation of the amounts of raw material components and by test manufacturing runs to determine the labor and other cost elements. Such computed costs then are accepted as tentative standards and are applied to all of the production of a period to produce an amount representing the standard cost of the entire output. The accuracy of the standard costs then may be judged

by comparison of the standard cost of the total production with the total actual cost as developed by the accounts. Agreement or approximate agreement between the actual cost and the standard-cost rates applied to the production indicates accuracy in total of the several standard-cost rates as estimated. Variation indicates error leading naturally to further tests and to appropriate adjustment of the standard rates until a point has been reached at which the adjusted rates may be accepted as true reflections of normal costs. Thereafter, the standard cost-rate value of the production of a period becomes a gauge by which the actual cost may be measured and judged as efficient or inefficient.

It is believed that the use of such standard costs in the dairy industry will be a means by which a form of control may be accomplished corresponding to and achieving the most important object of budgetary control as ordinarily understood.

In any dairy-industry manufacturing plant, whether a simple unit producing only butter and skim milk or whether a most complex unit producing everything obtainable from the raw material, it should not be difficult to compute standard or ideal unit manufacturing costs, exclusive of raw material, by analysis of past production experience, supplemented possibly by current tests. Similar analysis, based on the assumption of various cost prices for the raw material, will enable computation of the relative costs of the raw-material component in each unit of product or by-product even though the allocation of raw-material cost against by-products may necessitate assessment of arbitrary values. Such computation, for illustration, will develop a butterfat component cost in manufactured butter of 20 cents a pound upon the basis of a butterfat price of 25 cents a pound and corresponding costs of butterfat component for each of the possible raw butterfat prices.

Using such standard costs, (1) the normal manufacturing cost, and (2) the appropriate raw-material component cost consistent with the average cost of raw material during the period —the monthly production of a factory may be quickly computed to produce a total to compare with the actual production cost. Any excess of actual cost over the planned or standard cost of the products manufactured would indicate probable inefficiency or other circumstance appropriate or necessary of management attention. Any excess of computed standard cost of the production over its actual cost would be indicative of an efficiency above the standard, attributable to an abnormal production quantity or to other circumstance.

The following short illustration will show the manner, in a simple case, of applying the standard rates to the product and the comparison with the actual costs:

Product	Quantity produced	Standard rates		Standard cost		
		R. M.	*Mfg.*	*R. M.*	*Mfg.*	*Total*
Butter—Bulk	156,000 lbs.	.200	.032	$31,200	$4,992	$36,192
Cut and wrapped	42,000	.202	.044	8,484	1,848	10,332
Total	198,000			$39,684	$6,840	$46,524
Actual cost				40,200	6,698	46,898
Excess:						
Standard over actual					$ 142	
Actual over standard				$ 516		$ 374

In the foregoing illustration the actual cost of the raw material in the production exceeds its computed standard cost, indicating, possibly, a wastage greater than normal. On the other hand, the actual cost of manufacturing is less than the standard cost indicating that full operating efficiency, other than that attributable to the indicated wastage, has been maintained.

Where the volume of product processed may vary considerably between months and will have an effect upon the unit manufacturing cost, the method is open to the refinement of using different standard costs for different volumes of production, thus making the standard manufacturing cost a closer measure of the efficiency of actual operations.

As has been pointed out, in those dairy manufacturing operations in which the volume of production is irregular and cannot be forecast, it is impracticable to estimate future expenses as a means of control. Accordingly, if there is to be any planning, it must be upon the basis of unit costs. By computing, upon the basis of careful estimates and tests, what the normal unit manufacturing cost of each product should be, standards may be obtained which will be usable as gauges of the efficiency of operations. It is true that such standards enable the determination of inefficiency only after the inefficiency has occurred, whereas theoretically budgetary control should aid in preventing excessive expenses before incurred. But the use of expense budgets in business as a means of absolutely preventing the occurrence of excessive or unauthorized expenditures would involve records and procedures which rarely would be practical. Accordingly, the principal value of the ordinary expense budget is to detect excessive expenditures quickly and before serious loss has occurred, an accomplishment not different in character from that to be reached by the use of standard unit-costs as a gauge of efficiency.

It may be said that the value of what is suggested is no more than that to be produced by a careful scrutiny of normally computed monthly costs. On its face, such a statement may appear true, and in those cases in which the methods of monthly cost computation are planned carefully and executed accurately, and the results are scrutinized and reviewed quickly and intelligently, the resultant control of efficiency may not be greatly different. But except in such cases, and possibly in such cases as well, the availability of a carefully determined and conveniently computed standard cost valuation of a month's production will be found a more convenient if not a better means of judging efficiency.

Aside from the value which standard costs may have for the establishment of yardsticks with which to measure the efficiency of actual performance, it is believed that their use would result in greater economy in accounting and cost computation. In dairy manufacturing plants in which there is appreciable diversity of products, the usual cost accounting procedures require the actual segregation, in the original records and then in cost accounts or on cost statements, of labor, materials and other expenses, many of which must be distributed arbitrarily. The resultant computed unit costs not only will have involved a considerable amount of clerical work but will be of debatable accuacy if for no other reason than the uncertain accuracy of the bases of pro-rating fixed and other overhead expenses.

All of such continuous monthly analysis and elaborate cost computation would be obviated by the use of standard costs. The quantity of a month's production being known, it becomes the work of but a few moments to extend it to its standard value and to compare the result with the actual total costs as developed by the general accounts. Further, where the standard rates are carefully prepared, they probably will

be more accurate, during periods of normal operation, than ordinarily computed unit costs. Under ordinary circumstances the variation between the computed standard cost of a month's production and the aggregate actual cost will not be sufficient to raise a question as to the propriety of using the standard rates for inventory purposes. In fact, there is much to recommend the use of standard rates for inventory purposes in lieu of fluctuating, normally computed, cost rates.

If refinement be necessary, the standard-cost rates of each commodity produced may be segregated into the separate elements of labor, packing materials, and other variable and fixed expenses, so that the theoretical amount of labor, other variables, and fixed charges involved with the production of each month may be compared with the corresponding actual costs. The following table illustrates the manner in which standard cost rates and value of production may be broken down for comparison with segregated actual costs:

		Standard cost				
Production	Rate	Bulk 156,000 lbs.	Cut and wrapped 42,000 lbs.	Total	Actual	Difference
Manufacturing:						
Labor	.015	$ 2,340				
	.021		$ 882	$ 3,222	$ 3,261	$ (39)
Packaging materials	.001	156				
	.002		84	240	254	(14)
Manufacturing:						
General expense	.007	1,092				
	.008		336	1,428	1,388	40
Fixed charges	.005	780				
	.008		336	1,116	1,029	87
Other overhead	.004	624				
	.005		210	834	766	68
Total	.032	$ 4,992				
	.044		$ 1,848	$ 6,840	$ 6,698	$ 142
Raw material	.200	31,200				
	.202		8,484	39,684	40,200	(516)
Total		$36,192	$10,332	$46,524	$46,898	$(374)

In large plants having well defined manufacturing departments under separate responsible department superintendents, such as a plant producing both dry and condensed milk, it usually will be both convenient and desirable to segregate the department total costs through the general accounts. Where such is the case, the standard rates may be so arranged and applied as to develop standard department production valuations for comparison with the corresponding actual costs. In fact, standard costs are so varied in their uses as to be applicable, with varying degrees of value, in almost every manufacturing operation of the dairy industry.

While direct selling and delivery expenses may be planned and controlled by use of an ordinary budget, there may be some value in the application of the principle of standard cost rates.

In this case, however, it obviously is impossible actually to compute unit delivery costs, in addition to which reasonable variations in the quantities or the number of different products delivered will have no appreciable effect upon the amount of expense. As a rule, however, one or two products will represent the bulk of the value delivered, the remaining products constituting the equivalent of by-products. It will be practical to assign unit delivery allowances to these by-products by using the elements of base cost, selling price and objective profit as means of determining how much per unit may be reasonably allowed for delivery. These allowances being computed and applied to the average volume of the related deliveries enable a computation of an objective cost per unit for the delivery of the main product. Accordingly, a "standard delivery value" may be computed monthly for comparison with the actual expense in much the same way as the value of a month's production at standard cost rates is compared with the actual cost. However, whether such comparison has real value may be questioned, particularly as the expenses involved are controllable by ordinary means. It may have value in particular circumstances or for a particular purpose and, in any event, the idea is advanced as something that at least may be worth considering with that in mind.

There is little to be said in conclusion. The value of standard cost rates as a means of accomplishing efficiency is well recognized in those manufacturing operations in which they have been adopted, and there are many instances in which unit costs could not be controlled otherwise. It is believed that standard cost rates are adaptable for use in the majority of dairy manufacturing processes and that in many they will constitute the only, or at least the most convenient and economical, basis for using planned performance and costs as efficiency standards for the controlling of actual production costs.