COSTS OF SERVING COFFEE AND MILK IN SELECTED OREGON RESTAURANTS, JUNE-JULY, 1957

by

JERRY LEE COLBURN

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APPROVED:

Redacted for privacy

Associate Professor of Agricultural Economics

In Charge of Major

Redacted for privacy

Head of Department of Agricultural Economics

Redacted for privacy

Chairman of School Graduate Committee

Redacted for privacy

Dean of Graduate School

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COSTS OF SERVING COFFEE AND MILK IN SELECTED OREGON RESTAURANTS, 1/ JUNE-JULY, 1957

INTRODUCTION

A currently widespread policy among restaurant operators throughout the nation is to charge 5 to 15 cents more for milk than for competing beverages such as coffee when served with dinners. In some instances this differential has been extended to include ala carte orders as well. Opposition to this practice by interested individuals and groups has grown as the dairy industry has intensified its search for ways of expanding fluid milk markets.

Opponents of this practice contend that it cannot be justified on an economic basis because other costs associated with coffee sales outweigh the higher product cost for milk. This group generally believes that the elimination of this price differential would expand significantly the consumption of milk as a beverage in restaurants. Some restaurant operators accept this viewpoint and offer milk to their customers at the same price as coffee and other competing beverages.

The majority of restaurant operators attempt to justify the

1/ The costs developed in this study do not represent the total or absolute cost of serving coffee or milk. No attempt was made to measure costs normally considered to be overhead expenses.

extra charge for milk by pointing to the higher product cost for this beverage. Many of these operators acknowledge the greater costs involved in preparing and serving coffee but believe that these costs do not overcome the substantial difference in product cost. Furthermore, it often is believed that the demand for milk is relatively stable and would not increase appreciably if the differential were removed.

Data on the relative costs of serving coffee and milk are not generally available for use in the restaurant industry. In some instances restaurant operators have attempted to measure these costs in their own operations but the results are not available for general usage. The author has been unable to discover any trace of previous studies attempting to measure the costs of serving coffee and milk that are available to the individual operator in the restaurant industry.

PURPOSE OF STUDY

The purpose of this study was to measure the various costs of preparing and serving coffee and milk in selected Oregon restaurants.

No attempt was made to develop the total or absolute costs of preparing and serving the two beverages. Only those costs which were considered to vary between coffee and milk were measured. Such costs as building repairs and depreciation, manager's salary, etc., were not considered in the analysis.

The restaurants included in this study were selected to represent a cross-section of those found in the region. The costs determined for these restaurants were developed as a basis for evaluating the general pricing policy currently in existence for coffee and milk. More specifically, the study was undertaken to determine how much, if any, additional charges for milk could be justified under varying conditions.

It is expected that in certain instances the methods employed in determining the costs for these restaurants will have wider application than the actual data which were developed. The diverse nature of the restaurant industry makes it difficult to determine a specific set of costs that are widely applicable. However, the

procedures employed can be used in developing comparable costs for any given restaurant.

GENERAL PROCEDURES

Preliminary Investigation

Before formulating specific procedures for determining the costs of serving coffee and milk, a preliminary survey was undertaken to gain an understanding of the current practices in the restaurant industry and to determine the nature and extent of previous studies in this field. A request for available information and suggestions to aid in the development of the study was sent to leaders in the restaurant, coffee brewing, and dairy industries. The response to this request indicated a very limited knowledge of previous investigations of this nature but presented several suggestions that were helpful in isolating the specific cost elements to be considered.

A questionnaire was prepared to obtain information concerning current restaurant practices and the availability of the cost information necessary for this study. This questionnaire was presented to a group of restaurant operators by personal interviews. Information was obtained concerning current pricing policies, types of equipment employed, important variations in operating procedures, and the extent to which specific cost data were available. The information obtained by these questionnaires was

summarized and studied to determine the approach that would be most effective in measuring the costs of the two beverages.

Selection of Restaurants

In the early stages of the project development it was anticipated that a survey type of study would be most effective because of the wider application possible from data collected from a large number of restaurants operating under a varient of market conditions. However, the information obtained from the preliminary survey indicated that this potential advantage was weakened by other considerations. None of the restaurant operators was able to provide the detailed cost data needed for this type of study. To obtain the desired information it was found necessary to make an intensive investigation of each restaurant selected for the study. This requirement limited the scope of the study to a small number of restaurants and virtually eliminated the possibility of a survey type of study.

An alternative approach using a case-type study was selected because it would permit an intensive investigation of each restaurant included in the study. This approach eliminated the need to classify a large number of restaurants into several groups or classes. Initial attempts to classify restaurants were generally unsatisfactory

due to the diverse nature of the industry and the variety of operating conditions.

Based upon the preliminary investigations, four restaurants were selected for further analysis. These restaurants were selected because their characteristics represented a cross section of the bulk of restaurants in western Oregon.

Description of Restaurants

A brief description of each restaurant included in the study, along with accompanying diagrams, is presented below to permit an examination of each establishment for the basic features that greatly affect the importance of the various cost elements.

Restaurant A

Restaurant A represents the largest establishment analyzed during the study in both physical size and gross annual sales. The seating capacity is rated at 175 guests with approximately three-fourths of this capacity in the dining room. The interior arrangements and the location of each coffee, milk, water, and bussing station is shown in figure 1.

During the study the daily sales in this restaurant were at a seasonal low point. The sales consisted of a large proportion of

ala carte orders of small value, with a relatively small volume of dinner sales. The guests were largely professional people, shoppers, and managers and employees of local retail businesses.

The fountain and dining room in restaurant A had separate facilities for handling both coffee and milk. The milk was served from two bulk dispensers located in the rear of the fountain section and in the dining room. Coffee was prepared in two automatic, drip-type brewing units located near the milk dispensers. Each of these coffee units had four heating elements to maintain the serving temperature of the prepared coffee. Three separate coffee warmers or hot plates also were used as additional coffee stations. A cup and a saucer lowerator in the dining room, plus a saucer lowerator in the fountain, were employed to facilitate the coffee serving. Individual dispensers were available at each coffee station for serving cream to guests.

The staff of waitresses was divided so that those serving at the fountain did not serve in the dining room. During the study, two waitresses worked in the fountain section during most of the day. In the mornings and afternoons the dining room was served by one and occasionally two waitresses, with a third being added during the dinner and evening hours.

The dish washing facilities in restaurant A consisted of a semi-automatic dish washing machine with a capacity of 50 trays per

hour. A double sink was used for washing kitchen utensils manually. A disposal unit was included as an integral part of the dish washing operation. These facilities, along with the storage and draining tables, were constructed of stainless steel. The labor of washing and bussing dishes was performed by one machine operator and one bus boy for each of the two shifts. In this case the bus boy maintained the bussing stations for used dishes as well as replenishing the supplies of clean dishes throughout the restaurant.

Figure 1. Diagram of restaurant A

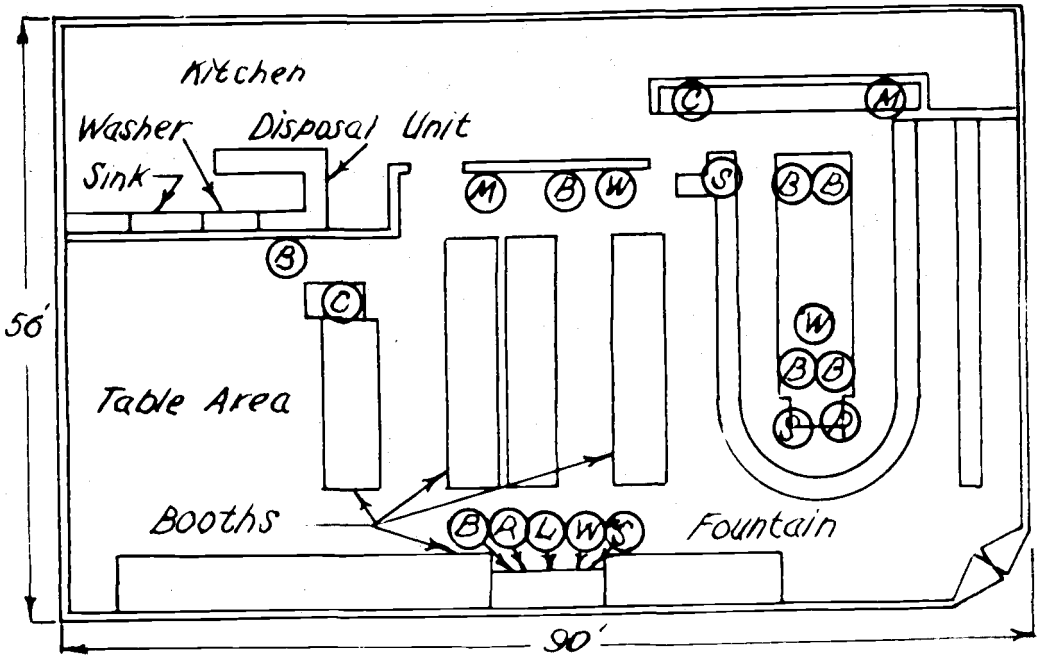
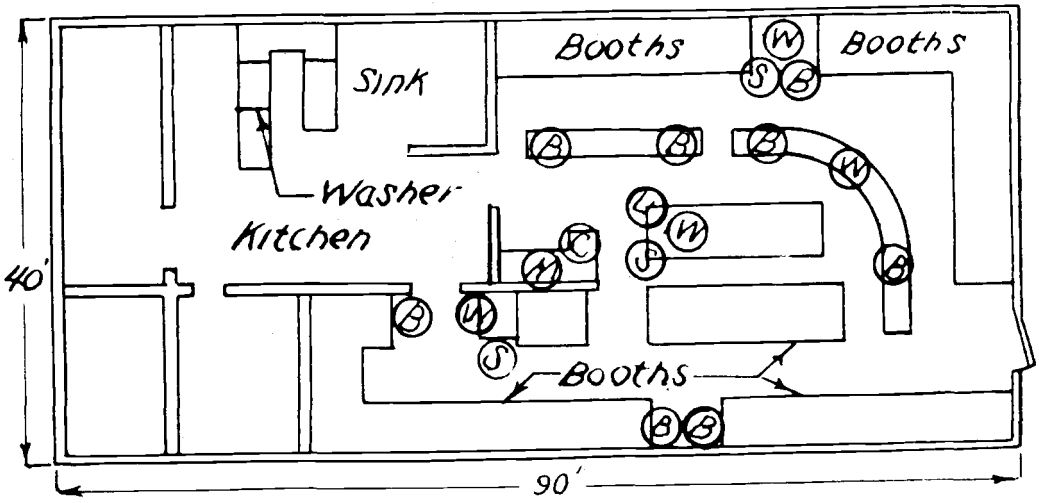


Figure 2. Diagram of restaurant B



Scale 1 inch = 18 feet

Key

- (M) Milk Dispenser
- (C) Coffee Maker
- (S) Coffee Station
- (W) Water Station
- (L) Saucer Lowerator
- (A) Cup Lowerator
- (B) Bussing Station

Restaurant B

Restaurant B was the second largest establishment analyzed during the study and in many respects was quite similar to restaurant A. The seating capacity in this restaurant was rated at 100 guests. Figure 2 illustrates the interior arrangements and the location of each beverage and bussing station. During the study period the sales in this restaurant also were at the seasonal low, however, the decline was not as great as in restaurant A. Restaurant B had a much higher percentage of guests for dinner and a correspondingly lower percentage of small ala carte orders. The majority of guests were professional people, shoppers, and employees of local businesses.

The milk in restaurant B was served from one bulk dispenser located behind the counter. Coffee was prepared in a single automatic, drip-type brewing unit equipped with one heating element to maintain the serving temperature of prepared coffee. Three separate coffee warmers were employed to provide additional coffee stations. One saucer lowerator was used at the central coffee station near the coffee brewing unit. Individual dispensers were available at each coffee station for serving cream to guests.

In this restaurant the number of waitresses on duty ranged from two in the early morning to five during the dinner hours.

The division of labor between the counter and booth service was not as rigid as in restaurant A. The waitresses assigned to each section regularly aided in serving other sections when conditions warranted.

The dish washing facilities consisted of a semi-automatic dish washing machine with a capacity of 50 trays per hour and double sinks for pre-washing the kitchen utensils before putting them in the dish washing machine. In this restaurant the washing facilities were constructed of galvanized iron. The labor of washing and bussing dishes was performed by two employees who alternated between the two tasks. During the lunch and dinner hours an additional employee served as bus boy.

Restaurant C

Restaurant C had a rated seating capacity of 35 guests. Figure 3 illustrates the interior arrangements and the various beverage stations. In contrast to the larger restaurants, this establishment received very little family dinner trade, but instead concentrated upon lunch sales and coffee breaks. The sales in this restaurant did not decline seasonally as was the case in the larger restaurants. Most of the guests were industrial workers, salesmen, deliverymen, and small businessmen from the nearby area.

The milk in this restaurant was served from a single bulk dispenser located at the rear of the counter area. The coffee was prepared in an automatic, drip-type brewing unit equipped with four heating elements to maintain the temperature of the prepared coffee. There were no other coffee stations in this restaurant. This was the only establishment studied in which the coffee brewing equipment was owned by the operator. Cream service in this restaurant was provided by multiple-service counter dispensers.

Figure 3. Diagram of restaurant C

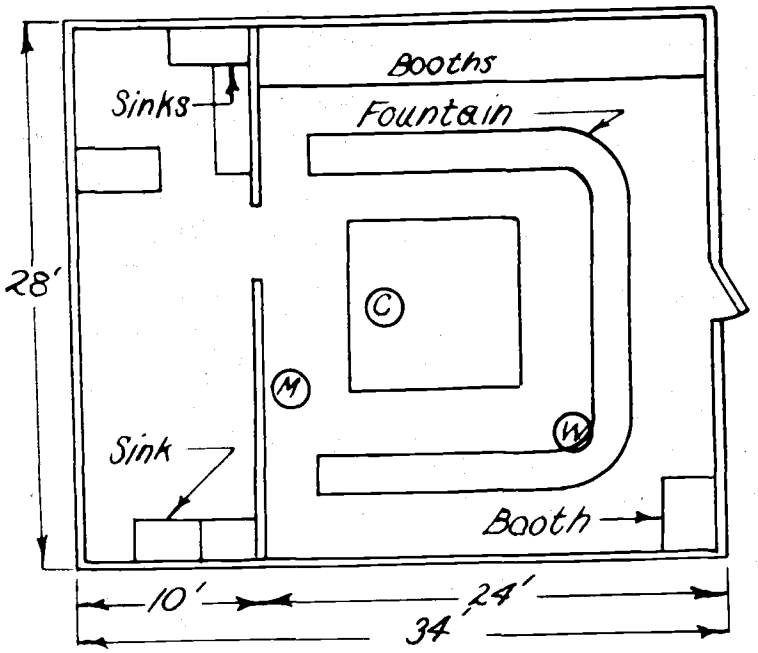
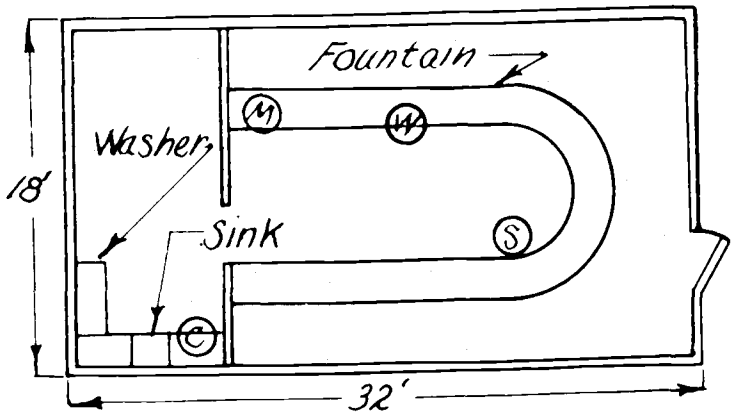


Figure 4. Diagram of restaurant D



Scale 1 inch - 10 feet

Key

(M) Milk Dispenser

(C) Coffee Maker

(S) Coffee Station

(W) Water Station

The labor force in restaurant C consisted of six persons including the owner. The number of waitresses on duty ranged from one in the early morning to three during the lunch hour. The labor of washing and bussing dishes was performed by one employee during the day, with another to finish up after business hours. In this case the bussing of dishes was confined to clean dishes since the used ones were transported to the kitchen by the waitresses during their clean up operations.

The entire dish washing operation in this restaurant was performed manually. The equipment used consisted of one triple sink for washing dishes and another double sink for washing kitchen utensils. This was the only restaurant studied that relied upon manual labor for the entire dish washing operation.

Restaurant D

Restaurant D represents the smallest establishment analyzed during the study. The rated seating capacity of this restaurant was 23 guests. The interior arrangements and the location of the beverage stations are illustrated in figure 4. This restaurant was esentially a fountain type of operation concentrating on sandwich sales, light lunches, and coffee breaks. Sales in this restaurant were subject to extreme seasonal fluctuations and were at a relatively low level at the time of the study. The majority of guests

were students, deliverymen, small businessmen, and employees of service industries.

The milk in this restaurant was served from a single bulk dispenser located at the rear of the counter. The coffee was prepared in a vacuum-type coffee maker using a multiple hot plate as the source of heat. Another coffee warmer at the front of the counter served as a coffee station. In this restaurant the coffee was served in mugs without saucers. The cream was served from multiple-service counter dispensers.

The labor force consisted of one kitchen employee and one waitress during most of the day. Another waitress was employed during the busy lunch and early afternoon hours. The labor of washing and bussing dishes was performed by all these employees at various times. The bussing operation consisted of handling clean dishes only since the waitress transported the used dishes directly to the kitchen for washing.

The dish washing facilities in this restaurant consisted of a semi-automatic dish washing machine with a capacity of 15 trays per hour. Kitchen utensils were pre-washed in a single sink before being placed in the machine. The dish washing machine was operated for brief periods whenever the used dishes had accumulated and the labor was available.

SPECIFIC PROCEDURES

Collection of Data

The basic data collected from each restaurant included in the study were obtained over a three day period in the middle of the week during the months of June and July, 1957. Prices or values applied to physical inputs in arriving at dollar costs were obtained from restaurant records at this time.

Products Used

A record of all materials used in the preparation and serving of coffee and milk was maintained during the study period. This was accomplished by weighing the opening and closing inventories and accounting for all purchases of coffee, milk, cream, sugar, and miscellaneous supplies. In this paper these inventory controls are referred to as perpetual inventories.

Dishes Washed

For each of the three days for which data were collected, an accurate count was kept of each piece passing through the dish washing equipment. The pieces counted were classified into groups to permit the allocation of equipment and labor costs on an equitable

basis. The information obtained from this source also served as a means of substantiating the data gathered by other techniques. Whenever possible, this practice of cross-checking was utilized to insure accuracy.

Guest Checks

During the study period the waitresses were requested to fill out the guest checks in complete detail. These were collected and later analyzed to provide the basis for several important allocations, as described on pages 35 through 41 .

Equipment

In most cases the restaurant operators were unable to provide the original costs and installation charges for the dish washers and related equipment because the installation had been made by previous owners and the records were not available.

To put these equipment costs on an equitable basis among the restaurants studied, the current prices for comparable equipment were applied. The cost of this equipment was obtained from the distributor for each type of equipment currently in use. Estimated installation charges were obtained from contractors familiar with restaurant installations. These estimates included plumbing and electrical wiring as well as storage and draining tables used in

connection with the dish washing operation.

Water, Gas, and Electricity

The water consumption and the volume of gas required to heat the water were determined from manufacturers' specifications and formulas provided by gas distributors. Electrical meters were attached to each of the various types of equipment operated in connection with the two beverages. This permitted accurate measurement of the power requirements of coffee makers, coffee warmers, milk dispensers, and dish washing machines.

Serving equipment

The breakage rates used in determining the serving equipment costs were obtained from the restaurants records whenever possible. In most instances, the actual breakage rates could not be determined from the restaurants records. In these cases the actual rates applied were obtained from the estimates of the restaurant operator.

Labor

The labor data in this study, with the exception of washing and bussing dishes, were collected through a work-sampling technique (1, p. 5). This technique is a statistical sampling procedure designed to obtain information about an activity or series of

activities. The technique is quite flexible so that the exact procedures are determined largely by the type of activities being studied and the nature of the data sought.

In this study the daily restaurant operations were divided into time periods with the relatively busy lunch and dinner hours separated from the lighter business hours in the mornings, afternoons, and evenings. Observations then were made during each of these periods on different days of the week. This made it possible to cover a sufficient number of conditions so that all potentially significant sources of variation were taken into account.

During each observation period the observer selected one or two waitresses and at intervals of 15 seconds recorded the exact tasks being performed by each waitress. These observations were recorded on a form designed to measure the time spent in tasks directly and indirectly related to the two beverages (Appendix A). An accurate count of pots of coffee brewed, as well as all servings of coffee, milk, and water, was maintained during each observation period.

The work-sampling technique employed in this study provided a number of advantages over the stop-watch system of measuring activities. The series of observations automatically weighted the calculated time for each serving to account for differences in original servings, refills, and multiple servings. This was

particularly advantageous in the case of coffee since each of these types of servings is a significant portion of the total sales. Similarly, the transportation time required to serve beverages at varying distances was automatically weighted. In the larger restaurants the observer was able to select a different combination of waitresses for each observations period. This eliminated any bias due to the relative efficiency of different waitresses.

The labor time required for washing and bussing dishes in restaurants A, B, and C was determined by totaling the working hours of those employees engaged in this operation. Time spent in other tasks by these employees was then subtracted from the total to obtain the hours spent in washing and bussing dishes.

In restaurant D the task of washing and bussing dishes was not assigned to specific employees. Here, the bussing labor was measured by the work-sampling technique. The washing labor was measured by performing a series of observations to determine the average time to prepare, load, and unload a tray of dishes. The average time per tray multiplied by the number of trays washed yielded the total time spent in this operation.

Methods of Allocating Joint Costs

A number of the tasks in the operation of a restaurant are indirectly related to every food and beverage item served to guests.

These tasks may be considered as joint services essential to the successful merchandising of the items appearing on the menu. The costs incurred in providing these services must be covered by the receipts obtained from the sale of the various items. In determining the costs of preparing and serving coffee and milk, the problem becomes one of allocating to each beverage an equitable portion of the joint costs involved. Two basic methods of allocating these joint costs were employed in this study: (1) the number of physical units handled, and (2) the relative value of the item in the average guest check.

In situations where the cost of providing the service was directly related to the number of physical units handled, allocations were made on this basis. This was the situation in allocating the equipment and labor costs for washing and bussing dishes. Since the cost of this operation is largely determined by the total number of pieces washed, the portion of the total cost allocated to each beverage was determined by the number of pieces that each contributed to the total.

The second method of allocating joint costs was followed when the costs to be allocated could not be determined by physical counts as in the dish washing operation. Serving water to guests is an example of this type of joint cost. No direct charge was made for this service so that the cost of serving water must be covered by the

cash receipts from the sale of other items. If the guest orders a cup of coffee or a glass of milk, the cost of serving water must be covered by the beverage served. If the guest has a complete dinner with beverage, the cost of serving the water should be distributed among the items purchased. Joint costs of this nature were allocated to each beverage according to its relative value in the average guest check of those guests including the respective beverage in their orders. The costs allocated in this manner included: serving water, cleaning up, taking orders and preparing checks, and idle time.

In addition to the two major allocations discussed above, it was found necessary to make several other allocations or allowances to account for certain restaurant practices. In instances where two items such as tea and coffee were served in the same china it was necessary to charge a portion of the breakage costs to each beverage. It also was necessary to allocate certain products such as cream and sugar to the various uses other than coffee. These allocations were made on the basis of sales relationships obtained from the guest checks. The exact procedures are presented in the discussion of the specific substance to which they apply.

In order to present the costs for the various elements on a per-guest basis, the employees' consumption of coffee and milk and their effects was removed from each element before the unit costs were

computed. If desired, the cost of the employees' consumption of both coffee and milk can be determined by totaling the costs presented for those elements to which this class of consumption applies.

ANALYSIS OF PHYSICAL INPUTS

Products Used

The amounts of each of the various products used in serving coffee and milk to guests in the respective restaurants studied are shown in table 1. As indicated earlier, the amounts of each of the products used were determined by taking a beginning and ending inventory and accounting for all purchases. Products used by employees, as well as those used for other purposes, were deducted from the total disappearance figures. Table 2 presents the number of units of each beverage served during the study. The volume of products used per 100 guests served, shown in table 3, was calculated by dividing the total consumption presented in table 1 by the number of guests served appearing in table 2.

Coffee

The total volume of coffee brewed during the study was calculated by dividing the pounds of coffee used by the amount required to make one pot. Multiplying this figure by the number of cups obtained per pot yielded the number of cups of coffee brewed. The amount of coffee used to brew one pot, as well as the number of cups obtained per pot, was determined in each restaurant by observing the actual practices.

Table 1. Volume of products used in serving coffee and milk, 4 Oregon restaurants, 3-day period, June-July, 1957

Products used	Unit	Volume used				
		Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants
In serving coffee:						
Coffee	lbs.	23.90	19.80	14.38	8.32	66.40
Cream	lbs.	17.69	18.37	17.35	5.31	58.72
Sugar	lbs.	12.21	8.94	6.78	3.76	31.69
Water a/ b/	cu. ft.	11.25	7.91	7.92	3.10	30.18
Ice b/	lbs.	31.65	23.78	25.01	0.67	81.11
In serving milk:						
Milk	lbs.	57.19	82.50	44.19	45.38	229.26
Water b/	cu. ft.	.07	.08	.08	.03	0.26
Ice b/	lbs.	1.92	3.22	1.93	.94	8.01

a/ Includes water used to brew coffee as well as water served to guests.
b/ Includes only the volume actually charged to the beverage on the basis of its value as a percentage of the total value of the average guest check.

Table 2. Units of coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Item	Units served				
	Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants
Coffee:					
No. of initial cups served	1378	1009	888	509	3784
No. of refills served	413	371	160	64	1008
Average volume per refill a/	.50	.65	.55	.50	
Total volume for refills a/	206	241	88	32	567
Volume of loss & spillage a/	27	18	12	20	77
Total no. of servings	1791	1380	1048	573	4792
Total cups brewed	1611	1268	988	561	4428
Total guests served	1378	1009	888	509	3784
Avg. volume per guest	1.17	1.26	1.11	1.10	
Milk:					
No. of glasses served	183	176	101	121	581

a/ All data in cupfuls.

Table 3. Volume of products required for coffee and milk per 100 guests served, 4 Oregon restaurants 3-day period, June-July, 1957

Products	Unit	Volume per 100 guests served				
		Restaurant A	Restaurant B	Restaurant C	Restaurant D	Avg. 4 Restaurants c/
In serving coffee:						
Coffee	lbs.	1.74	1.96	1.62	1.63	1.74
Cream	lbs.	1.28	1.82	1.95	1.04	1.52
Sugar	lbs.	.89	.89	.76	.74	.82
Water a/ b/	cu. ft.	.82	.78	.89	.61	.78
Ice b/	lbs.	2.30	2.36	2.82	.13	1.90
In serving milk:						
Milk	lbs.	31.25	46.88	43.75	37.50	39.84
Water b/	cu. ft.	.04	.04	.08	.02	.04
Ice b/	lbs.	1.05	1.83	1.91	.78	1.39

a/ Includes water used to brew coffee as well as water served to guests.
b/ Includes only the volume actually charged to the beverage on the basis of its value as a percentage of the total value of the average guest check.
c/ Simple average

Cream

Since cream was consumed with other items as well as coffee, it was necessary to make allowances for these other uses. The size of these allowances were based upon the estimates of the restaurant operators, their employees, and the observer making the labor analysis. Based upon these estimates, cream was allocated to tea at one-half the rate for initial coffee servings.

In restaurants A and B, an allowance of one individual creamer was made to every 10 coffee refills. In restaurants C and D, the cream was allocated to coffee refills on a straight volume basis; that is, a refill serving of one-half a cup was charged at one-half the rate of an initial coffee serving. A further allowance of 5 per cent of total cream consumption for other uses was made in restaurants C and D where the counter dispensers are used for fruits and cereals.

These variations in the method of allocating cream to coffee refills and other uses were due to the different types of cream service found in the restaurants studied. In all cases, the volumes of coffee sales, tea sales, and other uses were determined from the analysis of the guest checks.

Sugar

As was the case with cream, it was necessary to allocate a portion of the sugar consumption to other uses. In all the restaurants studied, an allowance of 5 per cent was made to other uses such as fruits and cereals. The remaining consumption was allocated to initial coffee servings and tea on an equal basis. Sugar was allocated to iced tea at four times the rate of coffee and tea. Sugar for refill coffee was allocated at a straight volume basis as described earlier. In all cases, the total sales of each item were obtained from the guest checks.

Water and Ice

The water used in preparing coffee was calculated by multiplying the ounces of water required per cup of coffee by the number of cups brewed and converting this figure to cubic feet. Similarly, the water and ice served to guests was calculated by multiplying the ounces of each required per serving to guests by the number of coffee or milk consumers served and converting this data to cubic feet and pounds respectively.

Milk

The volume of fluid milk consumed in each restaurant was

calculated by multiplying the number of glasses sold by the average size of the serving in ounces. The number of glasses served was obtained from the guest checks while the average serving size was determined by weighing a series of servings and averaging the weights. An inventory of the total milk used in each restaurant was maintained to determine the percentage of the total milk used that was sold as fluid milk.

Since fluid milk sales are not subject to the same type of refill servings as is true of coffee, any milk refills recorded during the study were considered as initial servings.

Labor

The total amounts of labor required to perform the various operations connected with the preparation and serving of coffee and milk are shown in table 4. Table 5 represents the labor requirements for each beverage on a per guest served basis. These unit labor requirements were calculated by dividing the total amounts of labor in table 4 by the number of guests served the respective beverages.

The total labor requirements were determined by either the work-sampling technique or the direct measurements as described earlier. The tasks included in each element of labor cost are discussed below.

Making Coffee

The element includes the tasks of measuring the fresh coffee grounds into the proper receptacle for brewing, attaching this receptacle to the brewing equipment, removing and disposing of the used grounds, and rinsing the receptacles and strainers before re-using. In restaurant D, the brewing equipment required that the waitresses fill the coffee bottoms with water manually. In this case, the task of supplying water was included in this element.

Dividing the total observed time spent in making coffee by the number of guests served yielded the average time per guest.

Serving Coffee

The serving labor was defined to include the assembly, filling, and transportation of a cup of coffee. The task of assembly included the actions of combining the cup, saucer, spoon, and individual creamers. In restaurants C and D, where multiple-service counter dispensers were used, the task of transporting the cream to guests was counted as other direct labor to coffee. The task of transporting the coffee pot to the guests and refilling their cups also was included as serving labor.

Dividing the total observed serving time by the number of guests served yielded the average time per guest.

Table 4. Total minutes of labor required to prepare and serve coffee and milk, 4 Oregon restaurants, 3-day period, June-July, 1957

Labor element	Minutes of labor required a/				
	Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants
Coffee:					
Making coffee	76.9	97.7	47.2	33.1	254.9
Serving coffee	407.1	343.6	222.9	108.8	1082.4
Other-direct to coffee	118.7	133.5	83.4	46.2	381.8
Clean-up	169.3	80.6	72.0	72.0	393.9
Serving water	70.0	23.9	37.6	0.7	132.2
Take order and prepare check	142.0	70.0	77.4	79.2	368.6
Idle time	131.4	71.8	31.2	38.4	272.8
Washing and bussing dishes	1141.2	940.8	438.2	119.4	2639.6
Total	2256.6	1761.9	1009.9	497.8	5526.2
Milk:					
Serving milk	43.5	46.4	22.2	24.0	136.1
Other-direct to milk	1.1	1.2	1.6	2.1	6.0
Clean-up	10.3	10.9	5.5	6.4	33.1
Serving water	4.2	3.2	2.9	1.0	11.3
Take order and prepare check	8.6	9.5	6.0	7.0	31.1
Idle time	9.6	7.0	2.3	5.0	23.9
Washing and bussing dishes	53.3	55.8	20.9	19.2	149.2
Total	130.6	134.0	61.4	64.1	390.7

a/ Minutes of labor shown represent only that portion actually allocated to the respective beverages.

Table 5. Minutes of labor required for coffee and milk per 100 guests served, 4 Oregon restaurants, 3-day period, June-July, 1957

Labor element	Minutes of labor per 100 guests served a/				
	Restaurant A	Restaurant B	Restaurant C	Restaurant D	Avg. 4 b/ Restaurants
Coffee:					
Making coffee	5.6	9.7	5.3	6.5	6.8
Serving coffee	29.5	34.0	25.1	21.4	27.5
Other-direct to coffee	8.6	13.2	9.4	9.1	10.1
Clean-up	12.3	8.0	8.1	14.1	10.6
Serving water	5.1	2.4	4.2	0.1	3.0
Take order and prepare check	10.3	6.9	8.7	15.6	10.4
Idle time	9.5	7.1	3.5	7.5	6.9
Washing and bussing dishes	82.8	93.2	49.3	23.5	62.2
Total	163.7	174.5	113.6	97.8	137.5
Milk:					
Serving milk	23.8	26.4	22.0	19.8	23.0
Other-direct to milk	0.6	0.7	1.6	1.7	1.2
Clean-up	5.6	6.2	5.4	5.3	5.6
Serving water	2.3	1.8	2.9	0.8	2.0
Take order and prepare check	4.7	5.4	5.9	5.8	5.4
Idle time	5.2	4.0	2.3	4.1	3.9
Washing and bussing dishes	29.1	31.7	20.7	15.9	24.4
Total	71.3	76.2	60.8	53.4	65.5

a/ Minutes of labor shown represent only that portion actually allocated to the respective beverages.
b/ Simple average.

Other Labor to Coffee

This element included all of the direct labor related to coffee not included in the making and serving elements. Included in this element were such tasks as rinsing coffee bottoms, cleaning other equipment directly related to coffee, transporting additional creamers to guests, filling cream dispensers, and filling the coffee dispenser from inventory stocks.

Dividing the total observed time for this element by the number of guests served yielded the average time per guest.

Serving Milk

Included in this element were the tasks of picking up the empty glass, filling it with milk, and transporting the glass to the guest. Dividing the total observed time for this operation by the number of guests served yielded the average time per guest.

Other Labor to Milk

This element includes all of the direct labor charged to milk not specifically covered in the above element. This included such tasks as cleaning the milk dispensing equipment or changing the dispensing cans when empty. Dividing the total observed time by the number of guests served yielded the average time per guest.

Clean Up

Included in this element were the tasks of removing used dishes from counters, booths, and tables; transporting these dishes to the bussing stations; wiping off counters and tables; cleaning equipment not entirely devoted to either beverage; and similar operations of this nature.

The portion of waitress time devoted to these operations was determined by the work-sampling procedure. By multiplying the total waitress time during the study period by the percentage of observed time devoted to clean up operations, the total clean up time for the study period was calculated. Total clean up time, of course, applied to all the items sold in the restaurant. Consequently, it was necessary to allocate a portion of this time to coffee and milk. After exploring several methods of allocating joint services such as clean up to the respective beverages, it was decided that the most practical approach was to allocate this labor on the basis of the relative value of each beverage in the average guest check of guests ordering the respective beverages.

The number of guests served coffee and milk, both ala carte and with dinners, is shown in table 6. Also, the amount of the average check (ala carte, with dinners, and weighted average) is indicated for each type of guest order. The value of coffee or milk

relative to the average guest check is shown in percentage figures along with the percent of guests ordering the respective beverages. These two sets of percentage figures were used in allocating the total waitress time to coffee and milk. The time allocated to each beverage was shown earlier in tables 4 and 5.

For example, in restaurant B it was determined that 19.32 hours were devoted to clean up operations during the study. In this case, 55.50 percent of the guests had ordered coffee, so a proportionate share of the clean up time was allocated to these guests (19.32 hours x 55.50 percent equals 10.72 hours). The average value of the guest check of guests ordering coffee in restaurant B was 80 cents. Coffee therefore equalled 12.57 percent of the average check (10 cents divided by 80 cents). Consequently, 12.57 percent of the clean up time, or 80.6 minutes, was allocated to coffee.

Similarly, 9.68 percent of the guests in restaurant B ordered milk so 9.68 percent of the clean up time was charged to these guests. In turn, milk represented 9.76 percent of the average check of these guests so 9.76 percent of the time charged to these guests was allocated to milk.

It will be noted that there was considerable variation among restaurants in the relationship of coffee or milk to the average guest check. Thus, the clean up time allocated to each beverage varied because of the actual differences observed, and also because of the

Table 6. Summary of data relating to guests served, coffee and milk sales, and average value of guest checks, 4 Oregon restaurants, 3-day period, June-July, 1957

Item	Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants a/
Total number of guests served	2682	1818	1226	861	6587
Average check value	$ .45	$ .71	$ .41	$ .28	$ .49
No. ala carte coffee sales	1140	516	573	465	2694
Average check value	$ .26	$ .40	$ .24	$ .18	$ .27
No. of dinner coffee sales	238	493	315	44	1090
Average check value	$1.10	$1.21	$ .81	$ .82	$1.05.
Total no. of coffee sales	1378	1009	888	509	3784
Average check value	$ .41	$ .80	$ .44	$ .24	$ .50
Percent of guests purchasing coffee	51.38	55.50	72.43	59.12	59.61
Percent that coffee represented of average guest check b/	24.50	12.57	22.53	42.66	25.56

Table 6. (cont.) Summary of data relating to guests served, coffee and milk sales, and average value of guest checks, 4 Oregon restaurants, 3-day period, June-July, 1957

Item	Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants a/
No. of ala carte milk sales	134	70	46	59	309
Average check value	$ .61	$ .56	$ .39	$ .42	$ .53
No. of dinner milk sales	49	106	55	62	272
Average check value	$1.66	$1.32	$ .88	$ .83	$1.18
Total no. of milk sales	183	176	101	121	581
Average check value	$ .89	$1.02	$ .66	$ .63	$ .84
Percent of guests purchasing milk	6.82	9.68	8.24	14.05	9.70
Percent that milk represented of average guest check b/	11.20	9.76	15.27	15.84	13.02

a/ Simple averages.
b/ For guests purchasing the respective beverages.

allocation procedure. The amounts of labor allocated to each beverage for the other joint services vary for the same reasons.

Serving Water

The tasks included in this element were picking up the empty glass, filling it with water and ice, and transporting the glass to the guest. In restaurant A, the dinner guests were served additional water by transporting the water in a pitcher. This task also was included in this element.

Dividing the total observed time spent in this operation by the number of glasses served yielded the average time per serving. Since serving water represents a joint task, the actual time allocated to coffee and milk was determined by the same procedures employed in allocating clean up time.

Take Orders and Prepare Checks

This element represents the observed time required to obtain the guest orders, record the orders on the guest checks, compute the charges, and present the check to the guests. In the case of restaurants C and D, this element also includes the waitresses' time devoted to operating the cash register. In restaurants A and B, the cash register normally was not operated by the waitresses on duty.

The percentage of the observed time devoted to these tasks was applied to the total hours of waitress labor during the study to determine the time devoted to this element during the three day period. Portions of the total time for this element were then allocated to coffee and milk by exactly the same procedures as described above in the allocation of clean up labor.

Idle Time

The idle time of the waitresses in the various restaurants was measured by the work-sampling technique in the same manner as the above joint services. The percentage of idle time found during the labor observations was applied to the total hours of waitress labor during the study to obtain the total idle time. As before, a portion of the total idle time was allocated to each beverage by applying the two percentage figures obtained from the guest checks.

Washing and Bussing Dishes

The labor involved in washing and bussing dishes was allocated to the respective beverages on the basis of the number of pieces that coffee and milk sales contributed to the total number washed. A summary of the number and type of dishes washed during the three day study is shown in table 7. Also, the percentage of pieces that each beverage contributed to the total is indicated at the bottom of

the table. Pieces used by employees were deducted in determining these percentages.

As silverware was handled with greater ease and efficiency than the other pieces washed, it was accounted for be treating it at a ratio of 2 to 1 in allocating the labor costs; that is, two pieces of silverware were said to be the equal of one other piece.

The efficiency in the handling of silverware relative to the other pieces was more pronounced when equiment costs were considered. It was observed that the equipment handled an average of 10 times as much silverware per washing cycle as was possible with the other pieces washed. In allocating equipment costs, the silverware was treated at a ratio of 10 to 1; that is, ten pieces of silverware were said to equal one other piece. The other various types of dishes were all counted as one piece in each case.

Restaurant B serves as an example of the procedure used in the allocation of dish washing labor to coffee and milk. During the study, coffee sales to guests accounted for 3,259 of the pieces washed. Dividing this figure by the total number of pieces washed (14,662, after dividing the silverware by 2) yielded the percentage of pieces contributed by coffee, or 22.23 percent.

Similarly, milk sales contributed 193 pieces or 1.32 percent of the total number washed. Multiplying the total labor cost of washing and bussing dishes by percentages found for the respective

Table 7. Numbers and types of dishes washed, 4 Oregon restaurants, 3-day period, June-July, 1957

Classification	Total dishes washed a/				
	Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants
Cups washed	1543	1267	967	544	4321
Saucers washed	1573	1344	1034		3951
Milk glasses washed	192	210	112	130	644
Other glasses washed b/	2879	310	1147		4336
Creamers washed	613	674	9	9	1305
Coffee bottoms washed	25	24	10	9	68
Teaspoons washed c/	2201	1748	1155	534	5638
All other silver washed c/	3040	3512	1157	567	8276
All other dishes washed	5960	8203	2179	1620	17962
Total no. washed	18026	17292	7970	3413	46501
Number of pieces for coffee	4357	3259	2438	795	10849
Percent of pieces used for coffee served to guests	28.28	22.23	36.70	27.78	28.75 d/
Number of pieces for milk	204	193	116	128	641
Percent of pieces used for milk served to guests	1.32	1.32	1.75	4.49	2.22 d/

a/ Includes pieces used for employees' consumption.
b/ Represents the same type of glass as is used for serving milk.
c/ Divided by 2 in each restaurant to compute the number of pieces washed in the allocation of labor costs; divided by 10 in A, B, and D, to allocate equipment costs.
d/ Simple average.

beverages yielded the portion to be charged to each beverage.

Equipment

Depreciation and Maintenance

Depreciation and maintenance expenses were computed for the various pieces of equipment actually owned by the restaurant operators. As mentioned earlier, the data relating to the dish washing equipment were obtained from equipment distributors and contractors. Data for coffee makers and milk dispensers were obtained from the restaurant operators. Dish washing equipment costs were allocated on the basis of the total number of dishes washed. Equipment costs directly related to either beverage were allocated on the basis of equipment utilization discussed later on page 58 .

Water, Gas, and Electricity

The physical amounts of water, gas, and electricity used in each of the restaurants are shown in table 8. The volume of water used in restaurant C was computed from direct observations of the washing operation. In the other restaurants the volume was computed from manufacturers' specifications for the particular equipment employed. The volume of gas necessary to heat the calculated volumes of water to the temperatures observed during the

study was determined by applying the appropriate formulas provided by gas distributors. Electrical requirements were measured by means of meters attached to each piece of equipment used during the study.

These elements of equipment cost were allocated to the respective beverages in the same manner as the equipment costs discussed above.

Serving Equipment

In restaurant A it was possible to determine the breakage rate exactly from inventory records. In the other restaurants the records were not available so that the breakage rates were estimated by the operators. The portion of this breakage actually allocated to each beverage was based upon the percentage of total use of each item that applied to the respective beverages. The percentage of utilization was determined from the analysis of the guest checks. Thus, the total cup and saucer breakage was allocated to coffee, tea, and hot chocolate on the basis of the sales volume of each beverage during the study.

Supplies

The physical volumes of washing compounds and disinfectants

Table 8. Amounts of water, gas, and electricity used in preparing and serving coffee and milk, 4 Oregon restaurants, 3-day period, June-July, 1957

Item	Units	Amounts used				
		Restaurant A	Restaurant B	Restaurant C	Restaurant D	4 Restaurants
Water:	cu. ft. a/					
Dish washer		150	274	146	66	636
Disposal unit		27				27
Coffee makers		10	7	7	3	27
	Total	187	281	153	69	690
Gas:	therm b/					
Dish washer		23.8	24.5	10.0	6.0	64.3
Electricity:	kwh					
Dish washer		14.9	27.2		1.1	43.2
Disposal unit		1.5				1.5
Coffee makers		79.4	45.2	49.0	37.8	211.4
Coffee warmers		38.2	26.5		4.8	69.5
Milk dispensers		5.8	2.5	5.0	2.0	15.3
	Total	139.8	101.4	54.0	45.7	340.9

a/ Data rounded to nearest cubic foot.
b/ 1 therm equals 100,000 B.T.U.'s.

used in each of the restaurants were measured by maintaining inventory controls during the study period. These items were allocated to each beverage in the same manner as the dish washing equipment discussed earlier.

The preliminary survey of restaurant operators indicated that the normal disappearance of napkins was approximately one per guest served. In many cases, the guest having a small ala carte order did not use any napkin. This indicated that a beverage such as coffee having a large percentage of ala carte sales should not be charged with as many napkins as a beverage served predominately with meals. This observation was offset to a large extent by the fact that many coffee consumers use two napkins; one to absorb coffee spilled into the saucer, and one for their personal use. For the purpose of this study, the napkins were allocated at a rate of one per guest served. The allocation of this napkin cost to beverage was based upon the relative value of the beverage in the average guest check of guests ordering coffee or milk.

COSTS OF SERVING COFFEE AND MILK

After the various physical inputs involved in the preparation and serving of coffee and milk were collected and allocated to the respective beverages, prices were applied to determine the cost of each input or element. The prices in effect at the time of the study are shown in table 9. These prices have been adjusted to remove all reported discounts and equipment rental charges.

The reported rental charges for coffee brewing equipment ranged from 2 to 5 cents for each pound of coffee used. As reported earlier, the coffee brewing equipment in three of the four restaurants studied was on a rental basis. The milk dispensing equipment also was rented in three of the restaurants studied. The rental charge for the milk dispensing equipment could not be accurately ascertained. To the extent that they may exist, rental charges are included in the reported product cost for milk.

Table 9. Price and wage rates used in determining the costs of serving coffee and milk, 4 Oregon restaurants, 3-day period, June-July, 1957

Item	Unit	Price or wage for restaurant			
		A	B	C	D
Products:		$	$	$	$
Coffee	lb.	0.89	0.86	0.835	0.85
Cream	qt.	.45	.45	.465	.45
Sugar	lb.	.098	.098	.099	.102
Ice	lb.	.012	.012	.012	.012
Milk	gal.	.88	.884	.85	.854
Labor:					
Waitress	hr.	.90	.90	1.10	1.00
Kitchen	hr.	1.00	1.00	1.00	1.00
Utilities:					
Water	100 cu. ft.	.145	.145	.221	.192
Gas	therm	.146	.151	.209	.245
Electricity	kwh	.014	.014	.017	.020
Supplies:					
Washing compound	lb.	.165	.165	.18	.19
Disinfectant	lb.		.09	.25	
Napkins	100	.099	.225	.10	.10

The prices shown in table 9 were applied to the physical inputs relating to coffee (table 1) to determine the total cost of each element. The unit costs per 100 cups brewed, shown in the left-hand column of coffee costs for each restaurant in tables 10 through 15, were obtained by dividing the resulting total costs by the number of cups brewed during the study. The unit costs per 100 guests served, shown in the right-hand columns of coffee costs, were obtained by dividing the total cost of each element by the number of guests served coffee during the study.

The unit costs shown for milk in each restaurant also were computed by applying the reported prices to the physical inputs and dividing the resulting total cost by the number of guests served milk during the study.

The unit costs shown for coffee have been presented in two columns to demonstrate the relative importance of two additional cost factors: (1) the loss or spillage associated with coffee sales and, (2) the volume of coffee served to guests as refills. The first factor did not exceed 3.3 percent of the coffee brewed in any of the restaurants studied and did not constitute a major cost. However, the practice of providing guests with coffee refills was found to be an important added cost of selling coffee.

Three of the four restaurants included in this study had a stated policy of charging guests for coffee refills on ala carte orders. This practice is generally accepted throughout the restaurant industry (2, p. 35). However, the analysis of the guest checks showed that this policy was not enforced more than 5 percent of the time in any of the restaurants. All of the restaurants provided guests with free coffee refills served with dinners.

Thus, the additional products, labor, and equipment employed in serving additional coffee refills represents an added cost relating to coffee for which there is no comparable cost associated with milk. Certain of the cost elements, such as serving water, are not affected

by the number of coffee refills given. In all cases, however, the total costs were first ascertained and then divided by the respective bases to demonstrate the importance of the refill factor. For this reason, any comparison of the costs of the two beverages must be made using the coffee costs shown in the right-hand column for each restaurant.

Product Costs

The unit product costs for coffee and milk are shown in table 10. The variation among the restaurants of the unit product costs shown in the left-hand column was due to such factors as the number of cups obtained from a pound of coffee, the rate of consumption of items such as cream and sugar, and the prices paid for the various physical products. Also, the costs shown for water and ice were affected by the relative importance of the beverage in the average guest check.

The unit product costs shown for coffee on a per guest served basis for each restaurant include the variations discussed above as well as the added cost of the coffee refills. The importance of these refill servings also varied among the four restaurants. The highest percentage of refills was found in restaurant B, where almost 37 percent of the coffee servings were of this nature. Refills in

Table 10. Unit product costs for coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Product cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Coffee	1.3203	1.5435	1.3441	1.6878	1.2156	1.3525	1.2602	1.3890
Cream	.2309	.2700	.3046	.3826	.3745	.4167	.1996	.2200
Sugar	.0745	.0871	.0694	.0872	.0678	.0754	.0660	.0727
Water (brewing coffee)	.0009	.0010	.0008	.0010	.0010	.0015	.0010	.0012
Water (served to guests)	.0001	.0001	.0001	.0001	.0002	.0002	.0000 a/	.0000 a/
Ice (served to guests)	.0245	.0286	.0234	.0294	.0317	.0353	.0015	.0016
Total	1.6512	1.9303	1.7424	2.1881	1.6908	1.8816	1.5283	1.6845
Elements for milk:								
Milk		3.1967		4.8125		4.3228		3.7240
Water (served to guests)		.0001		.0001		.0002		.0000 b/
Ice (served to guests)		.0131		.0229		.0239		.0097
Total		3.2099		4.8355		4.3469		3.7337

a/ The cost of this element in restaurant D was $0.00001.
b/ The cost of this element in restaurant D was $0.00004.

restaurants A, C, and D, accounted for 30, 18 and 13 percent of the total number of servings respectively.

Milk product costs were found to be considerably higher than were the product costs of coffee. In the four restaurants studied, the cost of milk alone accounted for 72 to 78 percent of the total cost developed for the beverage. The extreme variation in milk product costs among the restaurants was almost entirely due to differences in the size of the average serving. The average serving size ranged from 5.0 ounces in restaurant A to 7.5 ounces in restaurant B. The average serving in restaurants C and D was 6.5 and 6.0 ounces respectively. The importance of this variation in size of serving is demonstrated by the extreme variation shown in the milk product costs for the restaurants studied.

Labor Costs

The labor costs per unit of coffee and milk are shown in table 11. The various labor costs related to coffee are shown to be consistently higher than the comparable costs shown for milk. Several factors are responsible for these higher labor costs for coffee. The costs of those tasks directly related to coffee are somewhat higher than those directly related to milk because of the additional cost associated with coffee refills. For some labor elements, such as serving labor, the costs for coffee actually were lower when

Table 11. Unit labor costs for coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Labor cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Making coffee	.0716	.0834	.1157	.1453	.0876	.0975	.0985	.1085
Serving coffee	.3410	.3984	.3734	.4639	.3899	.4338	.3165	.3488
Other-direct to coffee	.1105	.1292	.1580	.1984	.1547	.1721	.1372	.1512
Clean-up	.1577	.1843	.0955	.1199	.1336	.1486	.2139	.2358
Serving water	.0652	.0762	.0283	.0355	.0698	.0776	.0022	.0024
Take order & prepare ck.	.1322	.1546	.0829	.1041	.1437	.1599	.2353	.2593
Idle time	.1223	.1430	.0852	.1070	.0579	.0644	.1141	.1257
Wash & bus dishes	1.1806	1.3803	1.2376	1.5540	.7389	.8221	.4527	.4990
Total	2.1811	2.5494	2.1766	2.7281	1.7759	1.9760	1.5704	1.7307
Elements for milk:								
Serving milk		.3568		.3951		.4023		.3307
Other-direct to milk		.0150		.0103		.0285		.0287
Clean-up		.0845		.0932		.1004		.0875
Serving water		.0348		.0276		.0526		.0140
Take order & prepare ck.		.0707		.0810		.1086		.0960
Idle time		.0787		.0598		.0414		.0694
Wash & bus dishes		.4851		.5284		.3448		.3381
Total		1.1256		1.1954		1.0786		.9644

computed on a per cup brewed basis. This relationship can be observed by comparing the two columns of coffee costs with the comparable costs shown for milk in table 11.

The costs shown for the indirect or joint tasks also reflect the added cost of serving refills. In this case, however, the costs per cup brewed for coffee also are higher than the comparable costs for milk. This is a result of the two methods employed in allocating these indirect costs. As was shown earlier, coffee represents a larger portion of the average guest check than does milk. Therefore, the cost of each element allocated by this method is proportionally higher for coffee. In a similar manner, the labor costs allocated upon the basis of the number of dishes washed also are higher for coffee because each serving of coffee contributes a porportionally greater share of dishes to be washed.

It will be noted that the most important element of labor cost, and the most variable as well, was the cost of washing and bussing dishes. The marked variation among the restaurants was due to the unique characteristics of the various operations. In restaurants A and B, this operation was performed by a minimum of two employees throughout the day. During much of the time these employees were either relatively idle or working at a slow rate. In this instance an overall increase in the volume of business would serve to reduce the unit costs for both beverages. However, a greater volume of

business would not necessarily change the current ratio of costs existing between coffee and milk. Thus, from the standpoint of relative costs, the increased volume would not be particularly important.

In restaurant C, the washing operation was performed by only one employee per shift. In this case the dish washer devoted a considerable portion of her time to other unrelated tasks which were not included in the washing time. Dish washing was performed for relatively short periods at an accelerated rate. Similarly, in restaurant D, the washing operation was performed at irregular intervals and at a rapid rate. In both these restaurants there was very little idle time or low levels of activity in the dish washing operations. In addition, the entire bussing of used dishes was performed by the waitresses in both restaurants. Since the distances traveled often did not exceed the distances to bussing stations in the larger restaurants, a somewhat greater efficiency resulted in this operation.

Equipment Costs

The unit equipment costs for coffee and milk are shown in table 12. In addition, the tables presented in Appendix B provide a complete breakdown of the various costs associated with each type of equipment studied.

The total depreciation costs for the various pieces of equipment

Table 12. Unit equipment costs for coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Equipment cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Dish washing equip.	.1175	.1374	.1079	.1354	.1117	.1242	.1041	.1146
Disposal unit	.0135	.0157						
Coffee makers	.0868	.1014	.1248	.1567	.1267	.1410	.1506	.1659
Coffee warmers	.0298	.0349	.0253	.0317			.0156	.0172
Lowerator (cups)	.0092	.0108						
Lowerator (saucer)	.0096	.0112	.0052	.0066				
Total	.2664	.3114	.2632	.3304	.2384	.2652	.2703	.2977
Elements for milk:								
Dish washing equip.		.0553		.0526		.0520		.1047
Disposal unit		.0064						
Milk dispensers		.0294		.0158		.0650		.1239
Total		.0911		.0684		.1170		.2286

actually owned by the restaurant operators were calculated by depreciating the equipment over a 10 year period and pro-rating these costs to the three day study. In a similar manner the annual maintenance expenses were pro-rated to the study period.

The total cost of the various utility services required for each piece of equipment was computed by multiplying the volume of each utility required (table 8) by the average cost per unit shown in table 9.

The rental charge for the coffee making equipment in restaurants A, B, and D, was determined by multiplying the pounds of coffee used (table 1) by the reported rental rates. As reported earlier, the rental charges on milk dispensers could not be accurately ascertained. To the extent that such charges do exist, they are incorporated in the product cost of the beverage.

The total costs thus determined for the dish washing equipment were allocated to both coffee and milk on the basis of the number of pieces that each beverage contributed to the total number washed. Multiplying the total cost of each element of equipment costs by percentage of pieces that each beverage contributed to the total number washed yielded the costs charged to the respective beverages.

The costs associated with equipment directly related to either beverage, such as coffee makers or milk dispensers, also were

allocated on the basis of equipment utilization. Three of the restaurants studied obtained hot water for making tea from the coffee brewing equipment. In cases such as this, the percentage of equipment costs charged to each beverage was determined by the analysis of the guest checks. For example, the analysis of guest checks in restaurant A indicated that tea represented 5 percent of the combined sales of tea and coffee. Therefore, 5 percent of the costs associated with the coffee brewing equipment was charged to tea. Similarly, the percentage of costs associated with milk dispensers actually charged fluid milk sales was determined by the percentage these sales represented of the total volume of milk used during the study.

Once the total equipment costs were determined and allocated to coffee and milk by the above procedures, the unit costs were calculated in the usual manner. That is, the two columns of coffee costs in table 12 were computed by dividing the total cost of each element allocated to coffee by the number of cups brewed, and by the number of guests served, respectively. The unit costs shown for milk were computed by dividing the total costs allocated to milk by the number of guests served.

An examination of table 12 shows that the total unit equipment costs relating to coffee were relatively uniform among the restaurants studied. It should be emphasized that these costs would not

be expected to decline markedly should the volume of coffee sales increase. This is because the fixed costs, such as depreciation and maintenance, are a relatively small portion of the total equipment costs. The majority of these costs, such as electricity and gas, would vary with changes in the level of sales.

The total equipment costs shown for milk demonstrate a greater degree of variation than those shown for coffee. In particular the costs shown for Restaurant D are quite high in comparison with the other restaurants. This was the only restaurant studied in which the milk dispensing equipment was owned by the operator. In this case, the unit depreciation costs are quite high due to the relatively low volume of business during the study. This effect also was noted in connection with the dish washing equipment costs in this restaurant. In this instance, an increase in the overall volume of business would materially reduce the equipment costs associated with milk, and to a lesser extent, those related to coffee.

Serving Equipment Costs

The total cost of the loss and breakage of serving equipment was determined by multiplying the reported annual loss or breakage by the most recent prices paid for this equipment and pro-rating this cost to the three day period. The portion of these costs

allocated to coffee and milk was determined in the same manner as the coffee making and milk dispensing equipment costs discussed earlier. Thus, if 10 percent of the saucers used during the study were in connection with foods and beverages other than coffee, then 10 percent of the cost associated with saucers was allocated to these other uses. The unit costs for both coffee and milk were calculated by the methods described earlier. These costs are shown in table 13.

Despite careful checking, the reported breakage rates for the restaurants studied remained exceptionally low. Various restaurant owners estimted that a more realistic breakage rate would be much higher than those reported. Any increase in these rates would be much higher than those reported. Any increase in these rates would result in a greater increase in costs relating to coffee because of the relatively high cost of replacing equipment associated with the serving of coffee.

Supply Costs

The total cost of the washing compounds and disinfectants used in connection with the dish washing operations was calculated by multiplying the amounts of these items used (table 1) by the reported prices paid shown in table 9. The portion of the total costs

Table 13. Unit serving equipment costs for coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Serving equipment cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Cups	.0268	.0313	.0249	.0312	.0455	.0507	.0360	.0397
Saucers	.0150	.0176	.0077	.0097	.0212	.0236		
Spoons	.0128	.0150	.0054	.0068	.0049	.0054	.0102	.0112
Creamers	.0079	.0093	.0030	.0038	.0026	.0029	.0048	.0053
Water glasses	.0032	.0037	.0026	.0033	.0027	.0030	.0003	.0003
Coffee bottoms	.0274	.0320	.0086	.0108	.0351	.0391	.0205	.0226
Sugar containers	.0084	.0099	.0052	.0066	.0005	.0005	.0009	.0010
Total	.1015	.1188	.0574	.0722	.1125	.1252	.0727	.0801
Elements for milk:								
Milk glasses		.0152		.0128		.0134		.0260
Water glasses		.0017		.0026		.0020		.0020
Total		.0169		.0154		.0154		.0280

allocated to coffee and milk was determined by multiplying the total costs calculated above by the percentage of pieces that each beverage contributed to the total number washed. The allocation is identical to the earlier allocation of dish washing equipment costs.

The total cost of the napkins used by coffee and milk consumers was calculated by multiplying the number of napkins used (one per guest) by the prices shown in table 9. The portion of the total cost actually allocated to each beverage was calculated by multiplying the total cost by the percentage that each beverage represented in the average guest check.

Table 14 shows the unit costs determined for the various supplies allocated to coffee and milk. These costs were calculated by the methods described earlier. The total costs of supplies for both coffee and milk are quite uniform among the restaurants studied with the exception of restaurant B. In this restaurant these costs are approximately double those shown for the other restaurants. Most of this variation is due to the larger volume of washing compound used in this restaurant. Restaurant B was the only establishment studied in which the washing compound was automatically supplied to the dish washing machine.

Restaurants B and C were the only establishments using a disinfectant material in the dish washing operations. Restaurant B employed this material only when silverware was being washed.

Table 14. Unit supply costs for coffee and milk served to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Supply cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Washing compound	.0515	.0602	.1026	.1288	.0314	.0349	.0290	.0319
Disinfectant			.0047	.0059	.0020	.0023		
Napkins	.0205	.0239	.0225	.0283	.0202	.0225	.0387	.0426
Total	.0720	.0841	.1298	.1630	.0536	.0597	.0677	.0745
Elements for milk:								
Washing compound		.0243		.0499		.0146		.0291
Disinfectant						.0010		
Napkins		.0111		.0219		.0152		.0159
Total		.0354		.0718		.0308		.0450

Thus, the cost of this element applies to coffee but not to milk. Restaurant C used a disinfectant throughout the washing operation so the cost is allocated to both beverages. In either case, table 14 shows the cost of this element to be negligible.

Summary of Costs for Serving Coffee and Milk

A summary of the various costs associated with coffee and milk is shown in table 15. It will be noted that the total costs shown for coffee generally decline as the restaurant size is reduced. This primarily is a result of lower labor costs which, in turn is due largely to lower costs in the dish washing operations. Differences in the other costs result from the unique characteristics of the various restaurants. For example, the variation in product costs for coffee largely is due to differences in the rate of cream consumption and the percentage of coffee which is served as refills.

The total costs shown for milk vary directly with the size of milk servings. As mentioned earlier, the product cost of milk accounts for approximately 75 percent of the cost of serving the beverage. In restaurant C, the product cost of milk actually exceeded the total costs related to coffee. When the product cost of milk is excluded, the remaining costs are remarkably uniform among the various restaurants. Differences among these other

Table 15. Summary of costs of serving coffee and milk to guests, 4 Oregon restaurants, 3-day period, June-July, 1957

Cost elements	Restaurant A		Restaurant B		Restaurant C		Restaurant D	
	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served	Per 100 cups brewed	Per 100 guests served
Elements for coffee:	$	$	$	$	$	$	$	$
Products	1.6512	1.9303	1.7424	2.1881	1.6908	1.8818	1.5283	1.6845
Labor	2.1811	2.5494	2.1766	2.7281	1.7759	1.9760	1.5704	1.7307
Equipment	.2664	.3114	.2632	.3304	.2384	.2652	.2703	.2977
Serving equipment	.1015	.1188	.0574	.0722	.1125	.1252	.0727	.0801
Supplies	.0720	.0841	.1298	.1630	.0536	.0597	.0677	.0745
Total	4.2722	4.9940	4.3694	5.4818	3.8712	4.3079	3.5094	3.8675
Elements for milk:								
Products		3.2099		4.8355		4.3469		3.7337
Labor		1.1256		1.1954		1.0786		.9644
Equipment		.0911		.0684		.1170		.2286
Serving equipment		.0169		.0154		.0154		.0280
Supplies		.0354		.0718		.0308		.0450
Total		4.4789		6.1865		5.5887		4.9997

costs reflect the unique characteristics of the particular operation and tend to cancel out when added together. Thus, the labor costs tend to decline with the restaurant size but are offset by higher equipment costs.

The costs associated with milk exceed those for coffee by a maximum of 1.28 cents per guest served in restaurant C. Milk costs in restaurant B and D were found to exceed the comparable coffee costs by 0.71 and 1.13 cents respectively for each guest served. In restaurant A, it was found that coffee costs per guest served exceeded those of milk by 0.51 cents. From this table it can be seen that the cost spread in each restaurant is influenced greatly by the size of the average milk serving.

SUMMARY AND CONCLUSIONS

The purpose of this study was to measure the costs of serving coffee and milk in selected Oregon restaurants. More specifically, the study was undertaken to determine how much, if any, additional charges could be justified on a cost basis for milk served to guests

A preliminary survey was undertaken to gain information concerning current practices in the restaurant industry and to determine the extent of previous studies of this nature. The results of this survey were used to ascertain the particular cost elements to be studied, and also to serve as the basis for the further development of the project.

From the information obtained by the preliminary survey, four restaurants were selected for further analysis. These restaurants were selected because their overall characteristics represented a cross section of the bulk of the restaurant industry in western Oregon.

Each of the restaurants selected was studied intensively for a three day period during the summer of 1957. A system of inventory controls was adopted to measure the amounts of the various products and supplies utilized in connection with the sales of the two beverages. A labor analysis using a work-sampling technique was

employed to determine the labor requirements for the various tasks related to each beverage. Electrical meters were used to measure the power requirements of the various equipment used in the restaurants.

Information relative to the prices paid for physical inputs and breakage rates was obtained from restaurant records. Prices paid for water, gas, and electricity were obtained from records of the respective utilities. Equipment dealers and contractors provided data relative to the installation of equipment comparable to the types currently employed in each restaurant. These data were used to determine depreciation costs since restaurant operators often were unable to provide this information.

Certain services associated with the preparation and serving of coffee and milk are indirectly related to every food and beverage served to guests. The cost of performing these services must be equitably shared by all the items served. Two methods were employed to allocate these joint or indirect costs to coffee and milk.

In situations where the costs are directly related to the number of physical units handled, allocations were made on this basis. The cost of washing and bussing dishes is of this nature. In this case, the portion of the total cost allocated to each beverage was determined by the number of pieces that each contributed to the total number washed.

When the service performed was not directly related to the physical units handled, the cost was allocated to coffee or milk on the basis of the relative value of the beverage in the average guest check of those guests ordering the respective beverages. Serving water, cleaning up, taking orders, and idle time are examples of cost elements which were allocated in this manner.

The total cost of each element relating to the two beverages was computed for each restaurant using the physical units and prices obtained by the above means. The relationships obtained from the guest checks and records of dish washing operations were applied to the total cost of joint services to determine the actual charges to each beverage. The unit costs for coffee were first computed by dividing the costs allocated to coffee by the number of cups brewed during the study. In order to present the unit costs for each beverage on a comparable basis, the costs allocated to each beverage were then divided by the respective number of guests served.

The total costs associated with coffee showed a general decline as the restaurant size was reduced. This was primarily due to lower labor costs, particularly in the dish washing operations. The unique characteristics of each restaurant, such as varying rates of cream consumption or types of equipment employed, accounted for other differences in costs related to coffee.

The practice of providing guests with coffee refills was found to be an important factor in determining costs for coffee. Two columns of costs were presented for coffee to demonstrate the importance of this factor. It was found that providing coffee refills added from 10 to 25 percent to the costs of serving the beverage.

Total costs for milk are determined largely by the size of the milk serving. This single factor accounted for 72 to 78 percent of the cost of serving milk in the restaurants studied. Excluding this factor from the total costs yielded a total cost for the remaining elements that was remarkably uniform among the restaurants studied. A tendency for labor costs to decline in the smaller restaurants was offset by higher equipment costs in these establishments.

The costs associated with milk were found to exceed those for coffee by a maximum of 1.28 cents per guest served in restaurant C. In restaurants B and D, this cost spread was 0.71 and 1.13 cents respectively. In restaurant A, it was found that milk could be served for 0.51 cents less than coffee. Variations in these cost spreads were due mainly to the differences in the size of the average milk serving. These servings ranged in size from 5.0 ounces in restaurant A to 7.5 ounces in restaurant B.

These costs indicate that there is very little justification for the current practice in many restaurants of charging additionally

for milk served to guests. To the extent that the restaurants included in this study represent a typical cross section of the industry, any justification must be based on factors other than cost.

It should be remembered that the above cost spreads do not reflect the total cost of either beverage to the restaurant. No attempt was made in this study to measure the costs associated with overhead expenses such as rent or managements salary. An analysis designed to compare coffee and milk on a total cost basis would tend to further equate the cost of the two beverages in those restaurants where coffee costs were lower than those for milk.

Certain of the relationships developed in this study are subject to rather wide variation throughout the restaurant industry. The limited number of restaurants included in this study suggests the need for expanding the analysis to include more firms and a greater variety of operating conditions. Such an expansion would undoubtedly add to the validity of the costs developed for each beverage.

Another factor of greater importance in affecting the costs of coffee and milk is the seasonl fluctuation in coffee sales. In most restaurants the summer decline in coffee sales varies from 5 to 20 percent (2, p. 35). This seasonal variation greatly affects the costs associated with coffee sales. During the three day study in July, it was found in restaurant A for example, that 952 or

approximately 36 percent of the guests ordered fountain-type beverages. The bulk of these orders were on an ala carte basis with relatively small values. The management of this restaurant estimated from past experiences that nearly all of this trade would shift to coffee in the colder months. The effect of such a trend would be to materially reduce the value of the average order containing coffee. This in turn would result in coffee being charged with a much larger percentage of the joint costs of serving guests and would increase the cost of serving coffee on a per guest basis.

Similarly, an increase in the number of dinner guests ordering coffee tends to increase the costs of serving coffee. This would be due to the greater percentage of refill servings associated with dinner sales. Further study is needed to determine the relative importance of these seasonal fluctuations in coffee sales.

The study revealed a potential solution for those attempting to eliminate the pricing differential where it can be shown that some justification remains on the basis of cost. This would be to equate the costs of the two beverages by varying the size of the milk serving.

For example, in restaurant B the average serving of milk was found to be 7.5 ounces with a corresponding product cost per serving of 4.84 cents. The costs in this instance could be equalized

by reducing the size of the average serving by approximately one ounce. This would result in a serving of 6.5 ounces with a product cost of 4.01 cents. The cost for the two beverages would then be 5.48 cents for coffee and 5.36 cents for milk. Similarly, the size of the milk serving in restaurant A could be increased from 5.0 to approximately 6 ounces in equating the cost of preparing and serving coffee and milk.

While altering the size of the milk serving would effectively equate the total costs of the two beverages, further study is needed to determine the range within which the size of serving could be adjusted, and also whether such action would actually increase the consumption of fluid milk in restaurants.

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APPENDIX A

Appendix A. Form used to record work sampling observations

Date: _____ Restaurant: _____ Observer: _____

Start: _____ Stop: _____ Elapsed Time: _____

Elements Observed	No. of Observations Waitress A	Waitress B	Total	Element %
MILK:				
Get glass				
Fill glass				
Transporting				
Other-direct				
COFFEE:				
Assemble C&S				
Fill cup				
Transporting				
Brewing				
Other-direct				
WATER:				
Get glass				
Fill glass				
Transporting				
Other-direct				
OTHER TASKS:				
Clean-up				
Idle time				
Take order & Prepare check				
All other work				
			TOTALS:	

Record of Production

Initial servings	No. of refills
Coffee	
Milk	
Water	
No. of Pots Brewed	

APPENDIX B

Appendix table 1. Summary of costs, restaurant A

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served
Products:			$	$
Coffee			1.3203	1.5435
Cream			.2309	.2700
Sugar			.0745	.0871
Water (for brewing coffee)			.0009	.0010
Water (served to guests)			.0001	.0001
Ice (served to guests)			.0245	.0286
Total			1.6512	1.9303
Labor:				
Making coffee			.0716	.0834
Serving coffee			.3410	.3984
Other-direct to coffee			.1105	.1292
Clean-up			.1577	.1843
Serving water			.0652	.0762
Take order & prepare check			.1322	.1546
Idle time			.1223	.1430
Washing & bussing dishes			1.1806	1.3803
Total			2.1811	2.5494
Equipment:				
Dish washing equipment				
Depreciation	.0448	.0524		
Maintenance	.0037	.0043		
Electricity	.0036	.0042		
Water	.0038	.0045		
Gas	.0616	.0720	.1175	.1374

Cost elements of milk			Per 100 guests served
Products:			$
Milk			3.1967
Water (served to guests)			.0001
Ice (served to guests)			.0131
Total			3.2099
Labor:			
Serving milk			.3568
Other-direct to milk			.0150
Clean-up			.0845
Serving water			.0348
Take order & prepare check			.0707
Idle time			.0787
Washing & bussing dishes			.4851
Total			1.1256
Equipment:			
Dish washing equipment			
Depreciation	.0211		
Maintenance	.0017		
Electricity	.0017		
Water	.0018		
Gas	.0290		.0553

Appendix table 1. (cont.) Summary of costs, restaurant A

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served	Cost elements of milk		Per 100 guests served
Equipment (cont.):			$	$	Equipment (cont.):		$
Disposal unit					Disposal unit		
Depreciation	.0117	.0136			Depreciation	.0055	
Maintenance	.0007	.0009			Maintenance	.0004	
Electricity	.0004	.0004			Electricity	.0002	
Water	.0007	.0008	.0135	.0157	Water	.0003	.0064
Coffee maker #1					Milk dispenser #1		
Lease charges	.0282	.0330					
Electricity	.0585	.0683	a/ .0434	.0506	Electricity	.0360	
Coffee maker #2					Milk dispenser #2		
Lease charges	.0282	.0330					
Electricity	.0586	.0686	a/ .0434	.0508	Electricity	.0227	b/ .0294
Coffee warmers							
Electricity			.0298	.0349			
Lowerator (cups)							
Depreciation			.0096	.0112			
Lowerators (saucers)							
Depreciation			.0092	.0108			
		Total	.2664	.3114		Total	.0911

Appendix table 1. (cont.) Summary of costs, restaurant A

Cost elements of coffee	Per 100 cups brewed	Per 100 guests served	Cost elements of milk	Per 100 guests served
Serving equipment:	$	$	Serving equipment:	$
Cups	.0268	.0313	Milk glasses	.0152
Saucers	.0150	.0176		
Spoons	.0128	.0150		
Creamers	.0079	.0093		
Water glasses	.0032	.0037	Water glasses	.0017
Coffee bottoms	.0274	.0320		
Sugar containers	.0084	.0099		
Total	.1015	.1188	Total	.0169
Supplies:			Supplies:	
Washing compound	.0515	.0602	Washing compound	.0243
Napkins	.0205	.0239	Napkins	.0111
Total	.0720	.0841	Total	.0354
TOTAL COST TO COFFEE	$4.2722	$4.9840	TOTAL COST TO MILK	$4.4789

a/ Divided by 2 to determine the cost per 100 units.
b/ Divided by 2 to determine the cost per 100 units.

Appendix table 2. Summary of costs, restaurant B

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served
Products:			$	$
Coffee			1.3441	1.6878
Cream			.3047	.3826
Sugar			.0694	.0872
Water (for brewing coffee)			.0008	.0010
Water (served to guests)			.0001	.0001
Ice (served to guests)			.0234	.0294
Total			1.7425	2.1881
Labor:				
Making coffee			.1157	.1453
Serving coffee			.3734	.4639
Other-direct to coffee			.1580	.1984
Clean-up			.0955	.1199
Serving water			.0283	.0355
Take order and prepare check			.0829	.1041
Idle time			.0852	.1070
Washing and bussing dishes			1.2376	1.5540
Total			2.1766	2.7281
Equipment:				
Dish washer				
Depreciation	.0254	.0319		
Maintenance	.0018	.0023		
Electricity	.0070	.0088		
Water	.0071	.0089		
Gas	.0666	.0836	.1079	.1355

Cost elements of milk		Per 100 guests served
Products:		$
Milk		4.8125
Water (served to guests)		.0001
Ice (served to guests)		.0229
Total		4.8355
Labor:		
Serving milk		.3951
Other-direct to milk		.0103
Clean-up		.0932
Serving water		.0276
Take order and prepare check		.0810
Idle time		.0598
Washing and bussing dishes		.5284
Total		1.1954
Equipment:		
Dish washer		
Depreciation	.0124	
Maintenance	.0009	
Electricity	.0034	
Water	.0035	
Gas	.0324	.0526

Appendix table 2. (cont.) Summary of costs, restaurant B

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served	Cost elements of milk		Per 100 guests served
Equipment (cont.):			$	$	Equipment (cont.):		$
Coffee maker					Milk dispenser		
Lease charges	.0781	.0981					
Electricity	.0467	.0586	.1248	.1567	Electricity		.0158
Coffee warmers							
Electricity			.0253	.0317			
Lowerator (saucers)							
Depreciation			.0052	.0066			
		Total	.2632	.3305		Total	.0684
Serving equipment:					Serving equipment:		
Cups			.0249	.0312	Milk glasses		.0128
Saucers			.0077	.0097			
Spoons			.0054	.0068			
Creamers			.0030	.0038			
Water glasses			.0026	.0033	Water glasses		.0026
Coffee bottoms			.0086	.0108			
Sugar dispensers			.0052	.0066			
		Total	.0574	.0722		Total	.0154
Supplies:					Supplies:		
Washing compound			.1026	.1288	Washing compound		.0499
Disinfectant			.0047	.0059			
Napkins			.0225	.0283	Napkins		.0219
		Total	.1298	.1630		Total	.0718
TOTAL COST TO COFFEE			$4.3695	$5.4819	TOTAL COST TO MILK		$6.1835

Appendix table 3. Summary of costs, restaurant C

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served
Products:			$	$
Coffee			1.2156	1.3525
Cream			.3745	.4167
Sugar			.0678	.0754
Water (for brewing coffee)			.0015	.0017
Water (served to guests)			.0002	.0002
Ice (served to guests)			.0317	.0353
Total			1.6908	1.8818
Labor:				
Making coffee			.0876	.0975
Serving coffee			.3899	.4338
Other-direct to coffee			.1547	.1721
Clean-up			.1336	.1486
Serving water			.0698	.0776
Take order and prepare check			.1437	.1599
Idle time			.0579	.0644
Washing and bussing dishes			.7389	.8221
Total			1.7759	1.9760
Equipment:				
Dish washing equipment				
Depreciation	.0201	.0224		
Maintenance	.0015	.0017		
Water	.0120	.0133		
Gas	.0780	.0868	.1117	.1242

Cost elements of milk		Per 100 guests served
Products:		$
Milk		4.3228
Water (served to guests)		.0002
Ice (served to guests)		.0239
Total		4.3469
Labor:		
Serving milk		.4023
Other-direct to milk		.0285
Clean-up		.1004
Serving water		.0526
Take order and prepare check		.1086
Idle time		.0414
Washing and bussing dishes		.3448
Total		1.0786
Equipment:		
Dish washing equipment		
Depreciation	.0094	
Maintenance	.0007	
Water	.0055	
Gas	.0364	.0520

Appendix table 3. (cont.) Summary of costs, restaurant C

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served	Cost elements of milk		Per 100 guests served
Equipment (cont.):			$	$	Equipment (cont.):		$
Coffee maker					Milk dispenser		
Depreciation	.0376	.0418					
Maintenance	.0116	.0130					
Electricity	.0775	.0862	.1267	.1410	Electricity		.0650
		Total	.2384	.2652		Total	.1170
Serving equipment:					Serving equipment:		
Cups			.0455	.0507	Milk glasses		.0134
Saucers			.0212	.0236			
Spoons			.0049	.0054			
Creamers			.0026	.0029			
Water glasses			.0027	.0030	Water glasses		.0020
Coffee bottoms			.0351	.0391			
Sugar containers			.0005	.0005			
		Total	.1125	.1252		Total	.0154
Supplies:					Supplies:		
Washing compound			.0314	.0349	Washing compound		.0146
Disinfectant			.0020	.0023	Disinfectant		.0010
Napkins			.0202	.0225	Napkins		.0152
		Total	.0536	.0597		Total	.0308
TOTAL COST TO COFFEE			$3.8712	$4.3079	TOTAL COST TO MILK		$5.5887

Appendix table 4. Summary of costs, restaurant D

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served
Products:			$	$
Coffee			1.2602	1.3890
Cream			.1996	.2200
Sugar			.0660	.0727
Water (for brewing coffee)			.0010	.0012
Water (served to guests) a/			.0000	.0000
Ice (served to guests)			.0015	.0016
Total			1.5283	1.6845
Labor:				
Making coffee			.0985	.1085
Serving coffee			.3165	.3488
Other-direct to coffee			.1372	.1512
Clean-up			.2139	.2358
Serving water			.0022	.0024
Take order and prepare check			.2353	.2593
Idle time			.1141	.1257
Washing and bussing dishes			.4527	.4990
Total			1.5704	1.7307
Equipment:				
Dish washing equipment				
Depreciation	.0289	.0318		
Maintenance	.0044	.0048		
Electricity	.0009	.0010		
Water	.0055	.0060		
Gas	.0644	.0710	.1041	.1146

Cost elements of milk		Per 100 guests served
Products:		$
Milk		3.7240
Water (served to guests) b/		.0000
Ice (served to guests)		.0097
Total		3.7337
Labor:		
Serving milk		.3307
Other-direct to milk		.0287
Clean-up		.0875
Serving water		.0140
Take order and prepare check		.0960
Idle time		.0694
Washing and bussing dishes		.3381
Total		.9644
Equipment:		
Dish washing equipment		
Depreciation	.0290	
Maintenance	.0044	
Electricity	.0010	
Water	.0055	
Gas	.0648	.1047

Appendix table 4. (cont.) Summary of costs, restaurant D

Cost elements of coffee			Per 100 cups brewed	Per 100 guests served	Cost elements of milk			Per 100 guests served
Equipment (cont.):			$	$	Equipment (cont.):			$
Coffee maker					Milk dispenser			
Rental charge	.0291	.0320			Depreciation	.0975		
Electricity	.1215	.1339	.1506	.1659	Maintenance	.0078		
Coffee warmer					Electricity	.0186		.1239
Electricity			.0156	.0172				
		Total	.2703	.2977			Total	.2286
Serving equipment:					Serving equipment:			
Coffee mugs			.0360	.0397	Milk glasses			.0260
Spoons			.0102	.0112				
Creamers			.0048	.0053				
Water glasses			.0003	.0003	Water glasses			.0020
Coffee bottoms			.0205	.0226				
Sugar containers			.0009	.0010				
		Total	.0727	.0801			Total	.0280
Supplies:					Supplies:			
Washing compound			.0290	.0319	Washing compound			.0291
Napkins			.0387	.0426	Napkins			.0159
		Total	.0677	.0745			Total	.0450
TOTAL COST TO COFFEE			$3.5094	$3.8675	TOTAL COST TO MILK			$4.9997

a/ The cost of this element was found to be $0.00001 and $0.00002 respectively.
b/ The cost of this element was found to be $0.00002.