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Computer Analysis of Consumer Attitude and Consumption Data for Fluid Milk Products

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COMPUTER ANALYSIS OF CONSUMER ATTITUDE AND CONSUMPTION DATA FOR FLUID MILK PRODUCTS

by

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James Reed Fisher

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INTRODUCTION

The American public, with a per capita disposable income currently at an all time high, has become a source of vital concern to dairy market researchers. The unique socio-economic structure of the present generation causes the dairy industry to be concerned with how the consumer views its products. Effective educational and advertising programs must be developed to attract the taste and meet the demands of the consumer.

Two factors which greatly influence market research and advertising programs are the attitude of the consumer toward a given product and the relationship of attitude to the degree of actual milk consumption. To avoid unnecessary waste and decreased profits resulting from production in excess of consumer demands, a method of measuring consumer preference and consumption could conceivably affect the dairy producer, processor, and marketer.

To handle vast amounts of data and facilitate proper reduction and analysis of the data, the computer has become a reliable and time saving tool. A job of this complexity and size could not feasibly be measured in terms of "man hours" required for completion. The task has become practical only when it is considered in terms of what reductions and summarizations can be made from the raw data using computer implementation.

The data analyzed in this study resulted from personal interviews of 360 randomly selected households in metropolitan Salt Lake City, Utah.

The survey was conducted by the Department of Agricultural Economics, Utah State University. Attitude studies of this nature are relatively new in the dairy field, hence it is hoped that this study and subsequent data analysis will be of value to researchers in gathering, analyzing, and presenting information pertaining to consumer attitude behavior. This study has been considered a pilot study since it was a preliminary investigation of raw data and a means of determining possible methods of evaluation of consumer attitudes and their relationship to consumption.

This report deals specifically with two computer programs. The first determines consumer attitude where the consumer has been categorized according to sex, age, and amount of milk consumption. The second measures the relationship between consumer attitude and consumption of milk where the consumer has been classified according to sex, age, and attitude or intensity of feeling. The basic problem dealt with in this paper is the derivation of computational methods and procedures for obtaining the average intensity of feeling and average amount of fluid milk consumption where the consumer is placed in the previously defined categories.

The computer programs employed in the analysis of the raw data have been written in FORTRAN IV for an IBM 360/44 computer system with 65K byte capacity. They could easily be adapted to any system with FORTRAN IV capability. No peripheral equipment has been required for computation. The basic devices used were the card reader and printer, referred to as standard input/output units.

The objective of this report has been to familiarize the dairy research team with the techniques involved in analyzing consumer attitude and consumption data for fluid milk products on a high-speed digital computer system.

PROBLEM DESCRIPTION

Product Breakdown

The fluid milk products analyzed in this report were:

1. Milk in bottles and cartons.
2. Regular whole milk.
3. Two-percent (low fat) milk.
4. Skim milk.
5. Non-fat dry (powdered) milk for drinking.

Questionnaire Content and Coding for Analysis

A comprehensive questionnaire was developed with the intent of providing researchers with a reliable measure of consumer familiarity and consumption of fluid milk products. A copy of the questionnaire is presented in Appendix A.

Each respondent sampled was questioned regarding his or her familiarity and consumption of each milk product. Respondents indicated their intensity of agreement or disagreement, on a scale of 7, concerning 30 attitude statements. The attitude statements were presented in the questionnaire in the form of semantic statements--two polar or opposite statements. Intensity of feeling was then established by a scale value between 1 and 7. Each statement was ranked by the respondent for each of the five milk products.

In an effort to define the attitude statements according to a central idea or connotation they were grouped into 6 categories which

were termed "attitude parameters" (Appendix B).

Once the data collection was completed, the questionnaire contents were transferred to punched cards in the format given in Appendix C. Each type of milk product was identified by a card number located in columns 7 and 8. The milk products were identified by the following card numbers.

Card Number	Milk Product
51	Milk in bottles and cartons
52	Regular whole milk
53	Two percent (low fat) milk
54	Skim milk
55	Non-fat dry (powdered) milk for drinking

Since 360 individuals were sampled in the study there were 360 observations for each of the five milk products.

Computer Input

Following data collection, keypunch, and verification, the data were sorted according to card number (first on column 8, then column 7). A sample of the input data is given in Appendix D.

PROGRAM I

Description

Program I was designed to compute the average intensity of feeling (average attitude) for consumers classified according to age and consumption within sex. All respondents, disregarding sex, were also classified according to age, consumption, acquaintance with the product, and frequency of consumption.

Three age groups were defined: 15-19, 20-34, and 35 and over. Consumption level groups were determined by the amount of fluid milk which the respondent drank the day preceding the interview. There were three groups: high consumers (three or more glasses), medium consumers (less than three but more than one), and low consumers (one glass or less including non-consumers). The "acquaintance with the product" category was based upon the first attitude statement and has seven groups. There were also seven groups associated with the "frequency of consumption" category (the second attitude statement). Appendix E defines the consumer category breakdown for the analysis performed in Program I.

Program I contains, besides a main program, four subroutine subprograms employing the same variable names in all. The subprogram names in the subroutine and call statements were written with no arguments. One long COMMON statement was written which contained the names of all variables whose values were needed for computations

in more than just the main program or a subroutine subprogram. The COMMON statement was duplicated and included in the main program and all subprograms.

Main Program

The three primary functions of the main program were the initialization of arrays, input of data, and classification of each respondent.

Symbolic names used to define arrays were initially set to zero and were thereafter used to accumulate the sums of the attitude statements for the various consumer categories.

The basic input quantities from each data card read by the computer were the card number, age and sex of respondent, and the 30 semantic or attitude statements. For attitude statements which had not been ranked by the respondent and which appeared as blanks in the data a routine was established to detect such cases and assign them an average value of 4.

The main program (Appendix F) contains the procedures for categorizing the respondents. Each respondent was categorized according to the breakdown previously described.

Three subroutine subprograms were called from the main program and were implemented to perform a step or function which was repeated many times.

Subprogram 1

The calling name of this subroutine subprogram was "INV" and its primary purpose was to reverse or invert 16 of the 30 attitude statements.

In the questionnaire the statements were arranged so as to avoid having all positive statements on one side and all negative statements on another. This procedure was established to prevent the respondent from answering the questions blindly, i.e., without actually considering each statement. Hence, a code of 1 in some cases represented complete agreement with a positive statement and in other cases complete agreement with a negative statement. The attitude statements for which inversion was required are presented in Appendix G. Appendix H contains subprogram "INV."

Subprogram 2

This subroutine subprogram contains procedures for calculating the sum of the attitude statement values for the various consumer categories. For each category, the number of respondents was also determined. The values computed in subprogram "CALC," as it is referred to, were used in another subprogram for calculation of the average intensity. Appendix I contains the listing of subprogram "CALC."

Subprogram 3

"PRIN" was the calling name of this subroutine subprogram. Its basic function was the print-out of final results including output documentation.

Within this subprogram the average intensity of feeling for each attitude statement was calculated by taking the summed values and dividing by the number of respondents, where both criteria were obtained from calculations in subprogram "CALC."

Since the attitude statements were not arranged in order according to the attitude parameters to which they belonged, a fourth subprogram,

called "P," was called from within subprogram "PRIN." "PRIN" did not print the results of the reordered statements, but designated their order to "P."

The average intensity of feeling for each attitude parameter was computed and printed out as a final function of "PRIN." The subprogram is contained in Appendix J.

Subprogram 4

This subroutine subprogram, called "P," was used to output the average intensity of feeling for the 30 attitude statements according to the attitude parameter group in which they belonged. Its secondary function was to accumulate the total of the average intensities by attitude parameter. This total was returned to "PRIN" where the average value for each parameter was found. See Appendix K for a listing of subprogram P.

Output

The output of Program I consisted of print-out documentation for identification of the consumer categories and product, as well as physical values representing the average intensity of feeling. No averages were computed for the "miscellaneous" attitude parameter. A sample of the output is illustrated in Appendix L.

A flowchart of Program I is presented in Appendix M and describes in symbolic form the computations performed by the main program and each subprogram. Appendix V contains a list of the symbols employed in Program I with a brief description of their connotation.

PROGRAM II

Description

Program II dealt with the problem of relating consumer attitude to actual milk consumption for the various milk products. The amount of milk consumption was measured in glasses to the nearest hundredth. The primary objective of this program was the computation of the mean consumption value for each of the 30 attitude statements. These mean values were then averaged to find the average value for each parameter. Consumers were categorized according to age, sex, and intensity of feeling.

Program II consisted of a main program and four subroutine subprograms. A COMMON statement was placed at the beginning of each type of program with the same function as the COMMON used in Program I. The data input to this program and computer requirements were also the same. Program II does not differ significantly from Program I, but several points might need clarification.

Main Program

Within the main program (Appendix N) arrays were initialized, basic input operations performed, and consumers categorized relative to sex and age. Reference was made in the main program to three of the four subprograms used in the analysis.

Input consisted of the card number, age and sex of respondent,

30 attitude statements, and the total glasses of milk consumed by the respondent the day prior to the interview.

A check was made for detection of attitude statements having no coded value and these were assigned a value of 4.

Subprogram 1

The first subroutine subprogram was called "INV" and performed the same function as Program I, subprogram 1. Subprogram "INV" is presented in Appendix O.

Subprogram 2

This subroutine subprogram was referenced by the name "CALC" and consisted of two large arrays. The first was for the accumulation of the total glasses consumed and the second for computing the total respondents. These calculations were made for each consumer class where intensity of feeling became a classification factor along with sex and age (Appendix P).

Subprogram 3

This subroutine subprogram called "PRIN," functioned primarily as an output routine for printing out computed results. It also provided documentation of output to simplify interpretation.

Another function of "PRIN" was the calculation of the average consumption. This computation employed the arrays formed in subprogram "CALC."

A fourth subprogram was called in PRIN for the purpose of reordering the attitude statements into their respective attitude

parameters. A weighted average was computed and printed for the first four attitude parameters. This average was computed from array values determined in the fourth subprogram. Appendix Q contains a listing of "PRIN." (Note: The attitude statement, "Plain drink; Stylish drink" was removed from the appropriateness parameter and placed in the miscellaneous parameter for Program II.)

Subprogram 4

Subroutine subprogram "P," as it is referred to, had the function of printing out the average consumption level and number of respondents for each attitude statement within each consumer category. Two arrays were calculated in "p" for determining a weighted average for each attitude parameter. The first array was formed by computing the sum of the product of average consumption by the number of respondents. The second array computed the total respondents for each attitude parameter (Appendix R).

Output

The output of this program included a table number, sex and age of the respondent, and a listing of the attitude scale values, 1-7. For each scale value the number of respondents and their average consumption was printed. This was accomplished for each attitude statement and finally the weighted averages were printed. See Appendix S for an illustration of the table number and associated consumer class. Appendix T contains a sample of the print-out for Program II. A flowchart for Program II is presented in Appendix U. Appendix W contains the symbols and descriptions of each as used in Program II.

SUMMARY

The programs incorporated in this report were designed to reduce the questionnaire data into tangible meaningful results relative to varying consumer classes. They dealt mainly with the analysis of consumer attitude and the relationship which it bears to actual milk consumption. Such information should be useful in the dairy industry to help identify the psychological aspects of consumer behavior. With this in mind, existing advertising programs could be improved to exert a greater influence on consumer habits and lead to increased consumption of fluid milk products.

The most meaningful results appeared in the output of Program II which related attitude to consumption. This output described the consumer classes for which milk consumption varied with intensity of agreement. From this information researchers could pinpoint areas of high and low consumption and adapt their educational and advertisement programs accordingly.

Further information concerning these programs or the data analyzed may be obtained from either:

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APPENDIXES

Appendix A

Questionnaire

Schedule Number _____

Tract Number _____

Block Number _____

Household Number _____

CONSUMER ATTITUDES TOWARD MILK

Western Regional Research Project WM-57

Address: _____

Interviewed: Husband___ Wife ___

Other: Age _____ Sex _____

Date of Interview ___ / ___ / 68

Time of Interview:(__:__)-(__:__)

Interviewed by: _____

DO NOT WRITE IN THIS SPACE

Checked by: _____

Date: _____

OK_____ Recall _____

Questions to be corrected:____

_____

Suggested Introduction: (Skip first paragraph if already talking to respondent)

Good _____, I am _____

from Utah State University. We are conducting a survey in the Salt Lake Metropolitan Area of consumer attitudes toward milk. From among your family, you have been chosen to be in our sample. Would you please answer the following questions?

1. Thinking back to yesterday, did you drink any milk with meals or snacks? Yes _____ No _____
2. If Yes: How many glasses did you drink?
   3 or more ___; Less than 3 but more than 1 ___; 1 or less ___;
3. If you drank milk yesterday, what kind was it?
   Regular whole milk ___; 2% (low fat) milk ___; Skim milk ___;
   Nonfat dry (powdered) milk ___; Other (specify) _____

4. If No to question 1: Do you sometimes drink milk?

   Yes _____ No _____

5. Have you ever had any of the following kinds of milk to drink? (Check yes without asking for each type of milk listed under question 3 above).

Regular whole milk	Yes _____	No _____
2% (low fat) milk	Yes _____	No _____
Skim milk	Yes _____	No _____
Nonfat dry (powdered) milk	Yes _____	No _____

(INTERVIEWER: HAND INTERVIEWEE THE ATTITUDE RATING SHEETS IN THE ORDER THEY HAVE BEEN PUT TOGETHER, ALSO A PENCIL AND CLIPBOARD IF NEEDED)

Now, instead of my asking you a lot of questions about your attitude toward milk, I would like to have you fill in your own ideas. That way you will find it more interesting and it will go much faster.

The top sheet simply asks for your ideas about "milk." On each line there is a pair of opposite ideas with seven spaces between them which you can mark to show how you feel about that particular product.

Take the top line, for example. If you were sure that you had never heard of milk, you could put an X or a check mark in the space next to the words "Never heard of it." On the other hand, if you know "milk" very well, you can put an X or a check mark in the space just before the words "Know the product very well." Or you can mark any one of the other five spaces in the middle to show that you know only a little about it, or more than a little, or almost enough to say that you know it very well.

Do the same for each of the pair of terms down the page. Just place a mark in the space in the direction of or next to the idea that best fits the product in your opinion. <u>If you don't know a kind of milk shown on a later sheet, simply fill in all of your answers according to what you would expect it to be from the name of it.</u>

Do not bother looking back to see how you checked other items. Make each check a separate judgment. Work as quickly as you can. Do not worry or puzzle over items. Your first ideas are the ones we want. On the other hand, please do your best, because we need your true ratings.

(INTERVIEWER: DO NOT OMIT ANY OF THE INSTRUCTIONS. EACH POINT IS IMPORTANT)

Schedule No. _____

Your impressions of

MILK IN BOTTLES AND CARTONS

	1	2	3	4	5	6	7	
Never heard of it								Know product very well
Have it very often								Never have it
Full of vitamins								Has no vitamins
Not liked by children								Liked by children
Tastes bad								Tastes good
Low in calories								High in calories
Low priced								High priced
Very nutritious								Not nutritious
High in protein								Low in protein
Watery								Rich
Liked by adults								Not liked by adults
Plain drink								Stylish drink
Good value for the money								Poor value for the money
Quality varies								Quality uniform
For weight watchers								For thin people
Low in calcium								High in calcium
Liked by entire family								Disliked by entire family
Goes with foods								Best by itself
Good restaurant drink								Not a good restaurant drink
Gives energy for hours								Doesn't give energy for hours
Refreshing								Not refreshing
For rich people								For poor people
Woman's drink								Man's drink
Contributes to attractiveness								Does not contribute to attractiveness
Convenient								Inconvenient
Boy's drink								Girl's drink
Gives no vitality								Gives lots of vitality
For company								Not for company
Many uses								Few uses
For me								Not for me

Schedule No. _____

Your impressions of

REGULAR WHOLE MILK

	1	2	3	4	5	6	7	
Never heard of it								Know product very well
Have it very often								Never have it
Full of vitamins								Has no vitamins
Not liked by children								Liked by children
Tastes bad								Tastes good
Low in calories								High in calories
Low priced								High priced
Very nutritious								Not nutritious
High in protein								Low in protein
Watery								Rich
Liked by adults								Not liked by adults
Plain drink								Stylish drink
Good value for the money								Poor value for the money
Quality varies								Quality uniform
For weight watchers								For thin people
Low in calcium								High in calcium
Liked by entire family								Disliked by entire family
Goes with foods								Best by itself
Good restaurant drink								Not a good restaurant drink
Gives energy for hours								Doesn't give energy for hours
Refreshing								Not refreshing
For rich people								For poor people
Woman's drink								Man's drink
Contributes to attractiveness								Does not contribute to attractiveness
Convenient								Inconvenient
Boy's drink								Girl's drink
Gives no vitality								Gives lots of vitality
For company								Not for company
Many uses								Few uses
For me								Not for me

Schedule No. _____

Your impressions of

TWO PERCENT (LOW FAT) MILK

	1	2	3	4	5	6	7	
Never heard of it	__	__	__	__	__	__	__	Know product very well
Have it very often	__	__	__	__	__	__	__	Never have it
Full of vitamins	__	__	__	__	__	__	__	Has no vitamins
Not liked by children	__	__	__	__	__	__	__	Liked by children
Tastes bad	__	__	__	__	__	__	__	Tastes good
Low in calories	__	__	__	__	__	__	__	High in calories
Low priced	__	__	__	__	__	__	__	High priced
Very nutritious	__	__	__	__	__	__	__	Not nutritious
High in protein	__	__	__	__	__	__	__	Low in protein
Watery	__	__	__	__	__	__	__	Rich
Liked by adults	__	__	__	__	__	__	__	Not liked by adults
Plain drink	__	__	__	__	__	__	__	Stylish drink
Good value for the money	__	__	__	__	__	__	__	Poor value for the money
Quality varies	__	__	__	__	__	__	__	Quality uniform
For weight watchers	__	__	__	__	__	__	__	For thin people
Low in calcium	__	__	__	__	__	__	__	High in calcium
Liked by entire family	__	__	__	__	__	__	__	Disliked by entire family
Goes with foods	__	__	__	__	__	__	__	Best by itself
Good restaurant drink	__	__	__	__	__	__	__	Not a good restaurant drink
Gives energy for hours	__	__	__	__	__	__	__	Doesn't give energy for hours
Refreshing	__	__	__	__	__	__	__	Not refreshing
For rich people	__	__	__	__	__	__	__	For poor people
Woman's drink	__	__	__	__	__	__	__	Man's drink
Contributes to attractiveness	__	__	__	__	__	__	__	Does not contribute to attractiveness
Convenient	__	__	__	__	__	__	__	Inconvenient
Boy's drink	__	__	__	__	__	__	__	Girl's drink
Gives no vitality	__	__	__	__	__	__	__	Gives lots of vitality
For company	__	__	__	__	__	__	__	Not for company
Many uses	__	__	__	__	__	__	__	Few uses
For me	__	__	__	__	__	__	__	Not for me

Schedule No.

Your impressions of

SKIM MILK

	1	2	3	4	5	6	7	
Never heard of it								Know product very well
Have it very often								Never have it
Full of vitamins								Has no vitamins
Not liked by children								Liked by children
Tastes bad								Tastes good
Low in calories								High in calories
Low priced								High priced
Very nutritious								Not nutritious
High in protein								Low in protein
Watery								Rich
Liked by adults								Not liked by adults
Plain drink								Stylish drink
Good value for the money								Poor value for the money
Quality varies								Quality uniform
For weight watchers								For thin people
Low in calcium								High in calcium
Liked by entire family								Disliked by entire family
Goes with foods								Best by itself
Good restaurant drink								Not a good restaurant drink
Gives energy for hours								Doesn't give energy for hours
Refreshing								Not refreshing
For rich people								For poor people
Woman's drink								Man's drink
Contributes to attractiveness								Does not contribute to attractiveness
Convenient								Inconvenient
Boy's drink								Girl's drink
Gives no vitality								Gives lots of vitality
For company								Not for company
Many uses								Few uses
For me								Not for me

Schedule No. _____

Your impressions of

NONFAT DRY (POWDERED) MILK FOR DRINKING

	1	2	3	4	5	6	7	
Never heard of it	_	_	_	_	_	_	_	Know product very well
Have it very often	_	_	_	_	_	_	_	Never have it
Full of vitamins	_	_	_	_	_	_	_	Has no vitamins
Not liked by children	_	_	_	_	_	_	_	Liked by children
Tastes bad	_	_	_	_	_	_	_	Tastes good
Low in calories	_	_	_	_	_	_	_	High in calories
Low priced	_	_	_	_	_	_	_	High priced
Very nutritious	_	_	_	_	_	_	_	Not nutritious
High in protein	_	_	_	_	_	_	_	Low in protein
Watery	_	_	_	_	_	_	_	Rich
Liked by adults	_	_	_	_	_	_	_	Not liked by adults
Plain drink	_	_	_	_	_	_	_	Stylish drink
Good value for the money	_	_	_	_	_	_	_	Poor value for the money
Quality varies	_	_	_	_	_	_	_	Quality uniform
For weight watchers	_	_	_	_	_	_	_	For thin people
Low in calcium	_	_	_	_	_	_	_	High in calcium
Liked by entire family	_	_	_	_	_	_	_	Disliked by entire family
Goes with foods	_	_	_	_	_	_	_	Best by itself
Good restaurant drink	_	_	_	_	_	_	_	Not a good restaurant drink
Gives energy for hours	_	_	_	_	_	_	_	Doesn't give energy for hours
Refreshing	_	_	_	_	_	_	_	Not refreshing
For rich people	_	_	_	_	_	_	_	For poor people
Woman's drink	_	_	_	_	_	_	_	Man's drink
Contributes to attractiveness	_	_	_	_	_	_	_	Does not contribute to attractiveness
Convenient	_	_	_	_	_	_	_	Inconvenient
Boy's drink	_	_	_	_	_	_	_	Girl's drink
Gives no vitality	_	_	_	_	_	_	_	Gives lots of vitality
For company	_	_	_	_	_	_	_	Not for company
Many uses	_	_	_	_	_	_	_	Few uses
For me	_	_	_	_	_	_	_	Not for me

Appendix B

Description of Attitude Parameters and the Attitude Statements of Which They are Composed

Attitude Parameter	Attitude Statement
Nutrition-Vitality	Has no vitamins; Full of vitamins. Not nutritious; Very nutritious. Low in protein; High in protein. Low in calcium; High in calcium. Doesn't give energy for hours; Gives energy for hours. Gives no vitality; Gives lots of vitality.
Taste-Refreshment	Not liked by children; Liked by children. Tastes bad; Tastes good. Watery; Rich. Not liked by adults; Liked by adults. Disliked by entire family; liked by entire family. Not refreshing; refreshing.
Appropriateness	Not a good restaurant drink; Good restaurant drink. Not for company; For company. Few uses; Many uses. Not for me; for me. Plain drink; Stylish drink.
Price-Value	High priced; low priced. Poor value for the money; Good value for the money.
Calorie Level	High in calories; low in calories. Quality varies; quality uniform.
Miscellaneous	Doesn't contribute to attractiveness; Contributes to attractiveness. Girls drink; Boys drink. Woman's drink; Man's drink. Never heard of it; Know product very well. For weight watchers; For thin people. Goes with foods; Best by itself. For rich people; For poor people. Never have it; Have it very often. Inconvenient; convenient.

Appendix C

Consumer Attitudes Toward Milk
Code for Machine Analysis

CARD 51

MILK IN BOTTLES AND CARTONS

Column	Identification Data
1	State 1. Washington 2. Utah 3. Montana 4. Wyoming 5. Nevada 6. Hawaii 7. Arizona 8. California 9. Oregon
2	City (To be coded by each state)
3-6	Questionnaire Number
7,8	Card Number
	Classification Factors
9	Member of Family 1. Husband 2. Wife 3. Other
10,11	Age
12	Sex 1. Male 2. Female
13	Drank Milk Yesterday With Meals or Snacks 1. Yes 2. No
14	If Yes to Question 1, How Many Glasses 1. 3 or more 2. Less than 3 but more than 1 3. 1 or less 4. No to question 1
	If Yes to Question 1, What Kind Was It
15	1. Regular whole milk 1. Yes 2. No 3. No to question 1
16	2. 2% low fat milk 1. Yes 2. No 3. No to question 1

Column	Classification Factors
17	3. Skim milk 1. Yes 2. No 3. No to question 1
18	4. Non-fat dry (powdered) milk 1. Yes 2. No 3. No to question 1
19	5. Other 1. Yes 2. No 3. No to question 1
20	If No to Question 1, Do You Sometimes Drink Milk 1. Yes 2. No 3. Drank milk yesterday
21	Have You Ever Had Any of the Following Kinds of Milk Regular Whole Milk 1. Yes 2. No
22	2% (Low Fat) Milk 1. Yes 2. No
23	Skim Milk 1. Yes 2. No
24	Non-fat Dry (Powdered) Milk 1. Yes 2. No

Attitude Parameters

Using 1 to indicate complete agreement with the first statement and 7 to indicate complete agreement with the second statement, and 2 through 6 to indicate intensities of agreement between the first and second statements; record the respondents feeling toward each of the following semantic statements.

25	Never heard of it; Know product very well
26	Have it very often; Never have it
27	Full of vitamins; Has no vitamins
28	Not liked by children; Liked by children
29	Tastes bad; Tastes good
30	Low in calories; High in calories
31	Low priced; High priced
32	Very nutritious; Not nutritious
33	High in protein; Low in protein
34	Watery; Rich

35	Liked by adults; Not liked by adults
36	Plain drink; Stylish drink
37	Good value for the money; Poor value for the money
38	Quality varies; Quality uniform
39	For weight watchers; For thin people
40	Low in calcium; High in calcium
41	Liked by entire family; Disliked by entire family
42	Goes with foods; Best by itself
43	Good restaurant drink; Not good restaurant drink
44	Gives energy for hours; Doesn't give energy for hours
45	Refreshing; Not refreshing
46	For rich people; For poor people
47	Woman's drink; Man's drink
48	Contributes to attractiveness; Doesn't contribute to attractiveness
49	Convenient; Inconvenient
50	Boy's drink; Girl's drink
51	Gives no vitality; Gives lots of vitality
52	For company; Not for company
53	Many uses; Few uses
54	For me; Not for me

Milk Consumption Previous Day (Code to Second Decimal Place)

(Respondents consumption drawn from the questionnaire, "Consumption and Use of Dairy Products and Their Substitutes," p. 4.)

67-69	Total glasses of milk consumed previous day

CARD 52

REGULAR WHOLE MILK

Code Same as Card 51

CARD 53

TWO PERCENT (LOW FAT) MILK

Code Same as Card 51

CARD 54

SKIM MILK

Code Same as Card 51

CARD 55

NON-FAT DRY (POWDERED) MILK FOR DRINKING

Code Same as Card 51

Appendix D

Sample of Questionnaire Data Coded for Computer Analysis

```
2100015123922433333112117345757544574444757111444143442   000
2100025115612433333111117117771117141417111111411177111   200
2100035123321312222312227527755117111737111314441473111   100
2100045113611112222311111714566712547212621131444242411   400
2100055132321212222311117314647226662776227571431427 36   200
2100065137422433333112127617757127111747117114411474 11   000
2100075123722433333211117127477117114447144114472444 17   000
2100085123721111222311111711774411441174711111441147711   300
2100095123721312222311117417777114111474414111441147111   100
2100105114911322221311117446174 45  2147441714444444444   000
```

Appendix E

Program I Consumer Breakdown

The average intensity of feeling was computed for the following breakdown of consumers:

1. Age Within Sex:

Male			Female		
Age 1	Age 2	Age 3	Age 1	Age 2	Age 3

2. Consumption Within Sex:

Male			Female		
Con 1	Con 2	Con 3	Con 1	Con 2	Con 3

3. Age:

All		
Age 1	Age 2	Age 3

4. Consumption:

All		
Con 1	Con 2	Con 3

5. Acquaintance with Product:

All						
Acq 1	Acq 2	Acq 3	Acq 4	Acq 5	Acq 6	Acq 7

6. Frequency of Consumption:

All						
Freq 1	Freq 2	Freq 3	Freq 4	Freq 5	Freq 6	Frea 7

Appendix F

Program I - Main Program

```
C     CONSUMER ATTITUDE TOWARD FLUID MILK PRODUCTS   PROGRAM NO. 1
      COMMON AGE (2),CON(2),IV(30),SUM(2,3,30),SUX(2,3,30),SUY(7,30),
     1SUZ(7,30),NR(2,3,30),NRS(2,3,30),NZ(7,30),NS(7,30),N,M,NN,NO,
     2S(32),AVEA(2,3,30),AVCON(2,3,30),AVACQ(7,30),AVFOC(7,30),ICN,JI
      DO 769 NIX=1,5
      DO 99 I=1,2
      AGE(I)=0.0
99    CON(I)=0.0
      DO 1 I=1,2
      DO 1 J=1,3
      DO 1 K=1,30
      SUM(I,J,K)=0.0
      SUX(I,J,K)=0.0
      NR(I,J,K)=0
1     NRS(I,J,K)=0
      DO 2 I=1,7
      DO 2 J=1,30
      SUY(I,J)=0.0
      SUZ(I,J)=0.0
      NZ(I,J)=0
2     NS(I,J)=0
      DO 500 J=1,360
      READ(5,100) ICN,IAGE,ISEX,IC,IV
100   FORMAT(6X,I2,1X,I2,I1,1X,I1,10X,30I1)
      DO 98 JO=1,30
      IF(IV(JO).NE.0)GO TO 98
      IV(JO)=4
98    CONTINUE
      JI=ISEX
      CALL INV
      IF(IAGE.LE.19)GO TO 20
      IF(IAGE.LE.34)GO TO 21
      AGE(JI)=3.
      GO TO 30
20    AGE(JI)=1.
      GO TO 30
21    AGE(JI)=2.
30    IF(IC.LE.3)GO TO 31
      IC=3
31    CON(JI)=IC
      ACQ=IV(1)
      F=IV(2)
      CALL CALC
500   CONTINUE
      CALL PRIN
769   CONTINUE
      END
```

Appendix G

Inversion of Attitude Statements

List of attitude statements requiring inversion:

1. Have it very often; Never have it.
2. Full of vitamins; Has no vitamins.
3. Low priced; High priced.
4. Very nutritious; Not nutritious.
5. High in protein; Low in protein.
6. Liked by adults; Not liked by adults.
7. Good value for the money; Poor value for the money.
8. Liked by entire family; Disliked by entire family.
9. Good restaurant drink; Not good restaurant drink.
10. Gives energy for hours; Doesn't give energy for hours.
11. Refreshing; Not refreshing.
12. Contributes to attractiveness; Doesn't contribute to attractiveness.
13. Convenient; Inconvenient.
14. For company; Not for company.
15. Many uses; Few uses.
16. For me, Not for me.

Appendix H

Program I - Subprogram 1

```
 SUBROUTINE INV
 COMMON AGE(2),CON(2),IV(30),SUM(2,3,30),SUX(1,3,30)SUY(7,30),
1SUZ(7,30),NR(2,3,30),NRS(2,3,30),NZ(7,30),NS(7,30),N,M,NN,NO,
2S(32),AVEA(2,3,30),AVCON(2,3,30),AVACQ(7,30),AVFOC(7,30),ICN,JI
 DIMENSION IA(7)
 DATA IA/7,6,5,4,3,2,1/
 K1=IV(2)
 K2=IV(3)
 K3=IV(7)
 K4=IV(8)
 K5=IV(9)
 K6=IV(11)
 K7=IV(13)
 K8=IV(17)
 K9=IV(19)
 K10=IV(20)
 K11=IV(21)
 K12=IV(24)
 K13=IV(25)
 K14=IV(28)
 K15=IV(24)
 K16=IV(30)
 IV(2)=IA(K1)
 IV(3)=IA(K2)
 IV(7)=IA(K3)
 IV(8)=IA(K4)
 IV(9)=IA(K5)
 IV(11)=IA(K6)
 IV(13)=IA(K7)
 IV(17)=IA(K8)
 IV(19)=IA(K9)
 IV(20)=IA(K10)
 IV(21)=IA(K11)
 IV(24)=IA(K12)
 IV(25)=IA(K13)
 IV(28)=IA(K14)
 IV(29)=IA(K15)
 IV(30)=IA(K16)
 RETURN
 END
```

Appendix I

Program I - Subprogram 2

```
      SUBROUTINE CALC
      COMMON AGE(2),CON(2),IV(30),SUM(2,3,30),SUX(2,3,30),SUY(7,30),
     1SUZ(7,30),NR(2,3,30),NRS(2,3,30),NZ(7,30),NS(7,30),N,M,NN,NO,
     2S(32),AVEA(2,3,30),AVCON(2,3,30),AVACQ(7,30),AVFOC(7,30),ICN,JI
40    N=AGE(JI)
      DO 4 K=1,30
      SUM(JI,N,K)=SUM(JI,N,K)+IV(K)
4     NR(JI,N,K)=NR(JI,N,K)+1
      M=CON(JI)
      DO 5 K=1,30
      SUX(JI,M,K)=SUX(JI,M,K)+IV(K)
5     NRS(JI,M,K)=NRS(JI,M,K)+1
      NN=ACQ
      DO 6 K=1,30
      SUY(NN,K)=SUY(NN,K)+IV(K)
6     NZ(NN,K)=NZ(NN,K)+1
      NO=F
      DO 7 K=1,30
      SUZ(NO,K)=SUZ(NO,K)+IV(K)
7     NS(NO,K)=NS(NO,K)+1
      RETURN
      END
```

Appendix J

Program I - Subprogram 3

```
      SUBROUTINE PRIN
      COMMON AGE(2),CON(2),IV(30),SUM(2,3,30),SUX(2,3,30),SUY(7,30),
     1SUZ(7,30),NR(2,3,30),NRS(2,3,30),NZ(7,30),NS(7,30),N,M,NN,NO,
     2S(32),AVEA(2,3,30),AVCON(2,3,30),AVACQ(7,30),AVFOC(7,30),ICN,JI
      DIMENSION IRA(3),IRC(3)
      WRITE(6,109)ICN
  109 FORMAT(1H1,47X,'CONSUMER ATTITUDE TOWARD MILK',//50X,'RONDO CHRIST
     1ENSEN',I3//)
      WRITE(6,110)
  110 FORMAT(10X,'MALES',18X,'FEMALES',18X,'ALL',/6X,'AGE',9X,'CON',9X,
     $'AGE',9X,'CON',9X,'AGE',9X,'CON',11X,'ACQ WITH PROD',16X,'FREQ OF
     ACON')
      WRITE(6,111)
  111 FORMAT(128H   1   2   3   1   2   3   1   2   3   1   2   3   1
     12   3   1   2   3   1   2   3   4   5   6   7   1   2   3   4   5
     A  6   7/)
      K=1
      DO 22 N=1,3
      IRA(N)=NR(1,N,K)+NR(2,N,K)
22    IRC(N)=NRS(1,N,K)+NRS(2,N,K)
      WRITE(6,102)  (NR(1,N,K),N=1,3),(NRS(1,N,K),N=1,3),(NR(2,N,K),N=1,
     13),(NRS(2,N,K),N=1,3),(IRA(N),N=1,3),(IRC(N),N=1,3),(NZ(NN,K),NN=1
     2,7),(NS(NO,K),NO=1,7)
102   FORMAT(1X,32I4/)
      DO 23 I=1,2
      DO 23 J=1,3
      DO 23 K=1,30
      IF(NR(I,J,K).EQ.0)GO TO 83
      AVEA(I,J,K)=SUM(I,J,K)/NR(I,J,K)
      GO TO 81
   83 AVEA(I,J,K)=0.0
   81 IF(NRS(I,J,K).EQ.0)GO TO 82
      AVCON(I,J,K)=SUX(I,J,K)/NRS(I,J,K)
      GO TO 23
   82 AVCON(I,J,K)=0.0
   23 CONTINUE
      DO 24 J=1,7
      DO 24 K=1,30
      IF(NZ(J,K).EQ.0.) GO TO 84
      AVACQ(J,K)=SUY(J,K)/NZ(J,K)
      GO TO 85
   84 AVACQ(J,K)=0.0
   85 IF(NS(J,K).EQ.0.) GO TO 86
      AVFOC(J,K)=SUZ(J,K)/NS(J,K)
   86 AVFOC(I,J)=0.0
   24 CONTINUE
      DO 25 J=1,3
      DO 25 K=1,30
      SUM(1,J,K)=SUM(1,J,K)+SUM(2,J,K)
      SUX(1,J,K)=SUX(1,J,K)+SUX(2,J,K)
      SUM(1,J,K)=SUM(1,J,K)/IRA(J)
```

```
25    SUX(1,J,K)=SUX(1,J,K)/IRC(J)
      DO 26 I=1,32
26    S(I)=0.0
      M=3
      CALL P
      M=8
      CALL P
      M=9
      CALL P
      M=16
      CALL P
      M=20
      CALL P
      M=27
      CALL P
      WRITE(6,800)
 800  FORMAT(60X,8HAVERAGES/)
      DO 31 I=1,32
31    S(I)=S(I)/6.
      WRITE(6,103)(S(I),I=1,32)
103   FORMAT(1X,32F4.1/////)
      DO 32 I=1,32
32    S(I)=0.0
      M=4
      CALL P
      M=5
      CALL P
      M=10
      CALL P
      M=11
      CALL P
      M=17
      CALL P
      M=21
      CALL P
      WRITE(6,800)
      DO 33 I=1,32
33    S(I)=S(I)/6.
      WRITE(6,103)(S(I),I=1,32)
      DO 34 I=1,32
34    S(I)=0.0
      M=12
      CALL P
      M=19
      CALL P
      M=28
      CALL P
      M=29
      CALL P
      M=30
      CALL P
```

```
      WRITE(6,800)
      DO 35 I=1,32
35    S(I)=S(I)/5.
      WRITE(6,103)(S(I),I=1,32)
      DO 36 I=1,32
36    S(I)=0.0
      M=7
      CALL P
      M=13
      CALL P
      WRITE(6,800)
      DO 37 I=1,32
37    S(I)=S(I)/2.
      WRITE(6,103)(S(I),I=1,32)
      DO 38 I=1,32
38    S(I)=0.0
      M=6
      CALL P
      M=14
      CALL P
      WRITE(6,800)
      DO 39 I=1,32
39    S(I)=S(I)/2.
      WRITE(6,103)(S(I),I=1,32)
      DO 40 I=1,32
40    S(I)=0.0
      M=24
      CALL P
      M=25
      CALL P
      M=15
      CALL P
      M=18
      CALL P
      M=22
      CALL P
      M=23
      CALL P
      M=26
      CALL P
      M=1
      CALL P
      M=2
      CALL P
      RETURN
      END
```

Appendix K

Program I - Subprogram 4

```
      SUBROUTINE P
      COMMON AGE(2),CON(2),IV(30),SUM(2,3,30),SUX(2,3,30),SUY(7,30),
     1SUZ(7,30),NR(2,3,30),NRS(2,3,30),NZ(7,30),NS(7,30),N,M,NN,NO
     2S(32),AVEA(2,3,30),AVCON(2,3,30),AVACQ(7,30),AVFOC(7,30),ICN,JI
      WRITE(6,104)AVEA(1,1,M),AVEA(1,2,M),AVEA(1,3,M),AVCON(1,1,M),AVCON
     1(1,2,M),AVCON(1,3,M),AVEA(2,1,M),AVEA(2,2,M),AVEA(2,3,M),AVCON(2,1
     2,M),AVCON(2,2,M),AVCON(2,3,M),SUM(1,1,M),SUM(1,2,M),SUM(1,3,M),SUX
     3(1,1,M),SUX(1,2,M),SUX(1,3,M),(AVACQ(I,M),I=1,7),(AVFOC(I,M),I=1,7
     4)
  104 FORMAT(1X,32F4.1/)
      S(1)=S(1)+AVEA(1,1,M)
      S(2)=S(2)+AVEA(1,2,M)
      S(3)=S(3)+AVEA(1,3,M)
      S(4)=S(4)+AVCON(1,1,M)
      S(5)=S(5)+AVCON(1,2,M)
      S(6)=S(6)+AVCON(1,3,M)
      S(7)=S(7)+AVEA(2,1,M)
      S(8)=S(8)+AVEA(2,2,M)
      S(9)=S(9)+AVEA(2,3,M)
      S(10)=S(10)+AVCON(2,1,M)
      S(11)=S(11)+AVCON(2,2,M)
      S(12)=S(12)+AVCON(2,3,M)
      S(13)=S(13)+SUM(1,1,M)
      S(14)=S(14)+SUM(1,2,M)
      S(15)=S(15)+SUM(1,3,M)
      S(16)=S(16)+SUX(1,1,M)
      S(17)=S(17)+SUX(1,2,M)
      S(18)=S(18)+SUX(1,3,M)
      S(19)=S(19)+AVACQ(1,M)
      S(20)=S(20)+AVACQ(2,M)
      S(21)=S(21)+AVACQ(3,M)
      S(22)=S(22)+AVACQ(4,M)
      S(23)=S(23)+AVACQ(5,M)
      S(24)=S(24)+AVACQ(6,M)
      S(25)=S(25)+AVACQ(7,M)
      S(26)=S(26)+AVFOC(1,M)
      S(27)=S(27)+AVFOC(2,M)
      S(28)=S(28)+AVFOC(3,M)
      S(29)=S(29)+AVFOC(4,M)
      S(30)=S(30)+AVFOC(5,M)
      S(31)=S(31)+AVFOC(6,M)
      S(32)=S(32)+AVFOC(7,M)
      RETURN
      END
```

Appendix L

Sample of Program I Output

CONSUMER ATTITUDE TOWARD MILK

RONDO CHRISTENSEN 51

Attitude Parameter - Nutrition-Vitality

	Males						Females						All						ACQ WITH PROD[b]							FREQ OF CON[c]						
	AGE			CON[a]			AGE			CON			AGE			CON																
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Respondents[d]	14	43	75	65	26	52	10	72	146	40	67	121	24	115	211	94	93	173	0	1	0	4	5	20	330	25	17	20	39	31	38	190
Vitamins	6.4	5.6	5.5	59.	5.7	5.3	6.1	6.4	6.2	6.2	6.3	6.2	6.3	6.1	5.9	6.0	6.1	6.0	0.0	2.0	0.0	4.5	4.8	5.4	6.1	5.3	0.0	5.5	5.6	5.7	6.0	6.4
Nutritious	6.6	5.8	5.9	6.4	5.5	5.7	6.2	6.4	6.4	6.3	6.3	6.5	6.4	6.2	6.2	6.4	6.1	6.3	0.0	3.0	0.0	7.0	5.6	6.3	6.2	5.6	5.7	5.9	6.0	6.2	5.9	6.5
Protein	6.1	5.1	5.7	5.8	5.2	5.4	6.1	6.1	6.0	6.1	5.9	6.1	6.1	5.7	5.9	6.0	5.7	5.9	0.0	2.0	0.0	6.7	4.6	6.1	5.9	6.0	5.8	5.9	5.6	5.5	5.6	6.0
Calcium	5.6	6.0	6.2	6.3	5.5	6.1	5.8	6.4	6.3	6.4	6.4	6.2	5.7	6.3	6.2	6.4	6.2	6.2	0.0	5.0	0.0	6.7	5.6	5.6	6.3	6.1	5.8	6.3	6.0	5.6	6.2	6.4
Energy	5.4	4.7	5.2	5.2	5.2	4.8	5.3	5.2	5.8	5.6	5.5	5.6	5.3	5.0	5.6	5.4	5.4	5.4	0.0	2.0	0.0	5.5	4.0	5.9	5.4	5.6	5.2	5.3	5.2	4.7	5.5	5.5
Vitality	5.5	4.8	5.5	5.5	5.0	5.2	5.5	5.7	5.6	5.5	5.6	5.7	5.5	5.3	5.5	5.5	5.4	5.5	0.0	2.0	0.0	5.7	4.6	5.7	5.5	5.7	5.8	5.8	5.2	4.8	5.6	5.5
AVERAGES																																
	5.9	5.3	5.6	5.8	5.3	5.4	5.8	6.0	6.0	6.0	6.0	6.0	5.9	5.8	5.9	5.9	5.8	5.9	0.0	2.7	0.0	6.0	4.9	5.8	5.9	5.7	4.7	5.8	5.6	5.4	5.8	6.1

Note: [a]CON = Average consumption

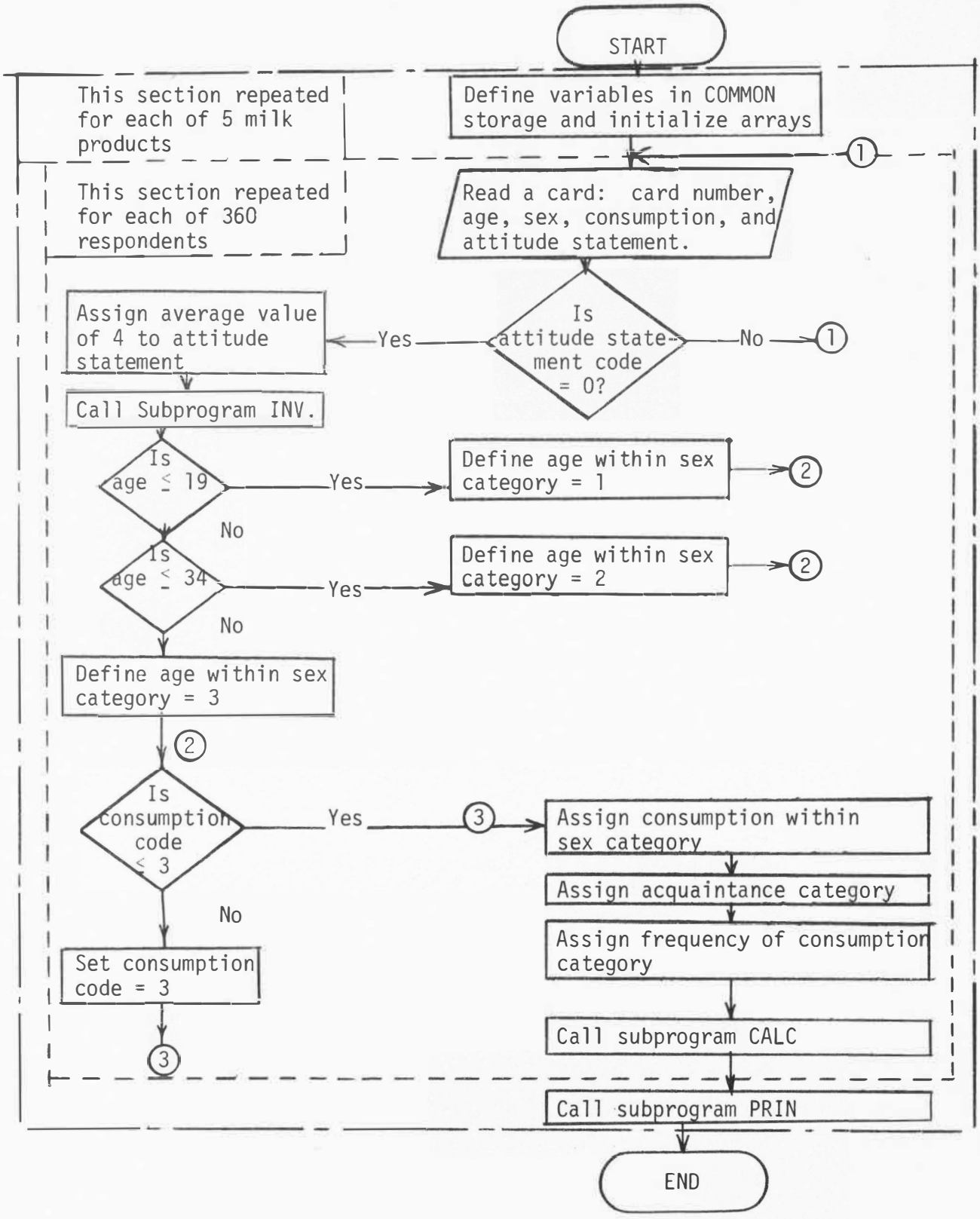
[b]ACQ WITH PROD = Acquaintance with product

[c]FREQ OF CON = Frequency of consumption

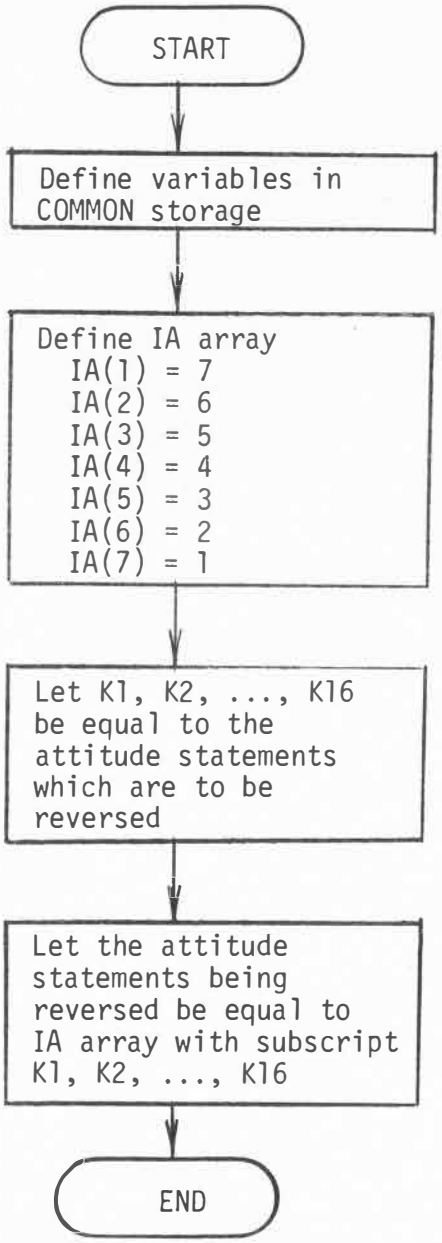
[d]The documentation on the left margin is not included as a part of the computer output.

Appendix M

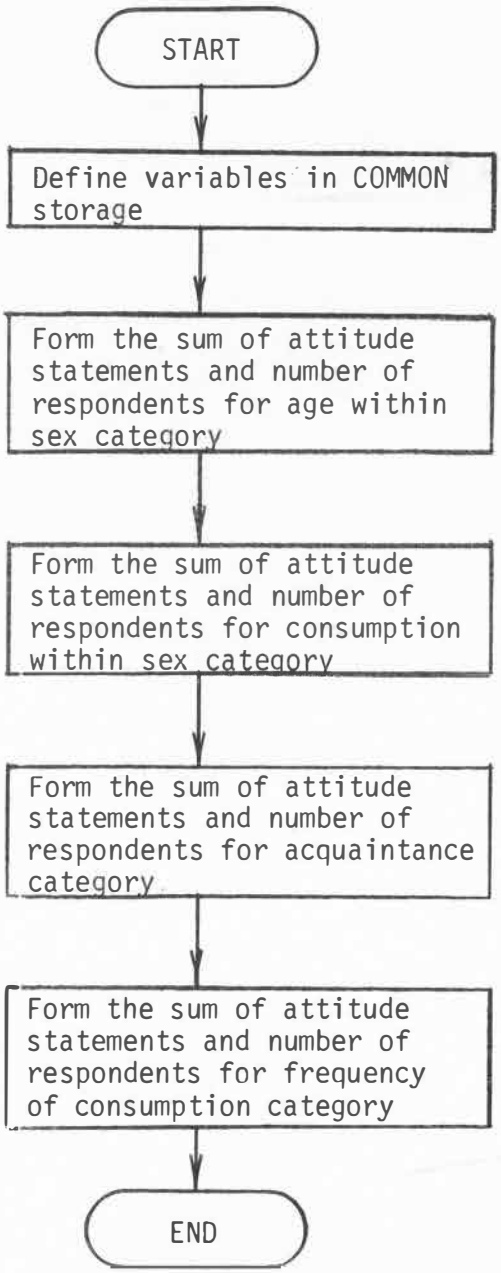
Flowchart of Main Program I



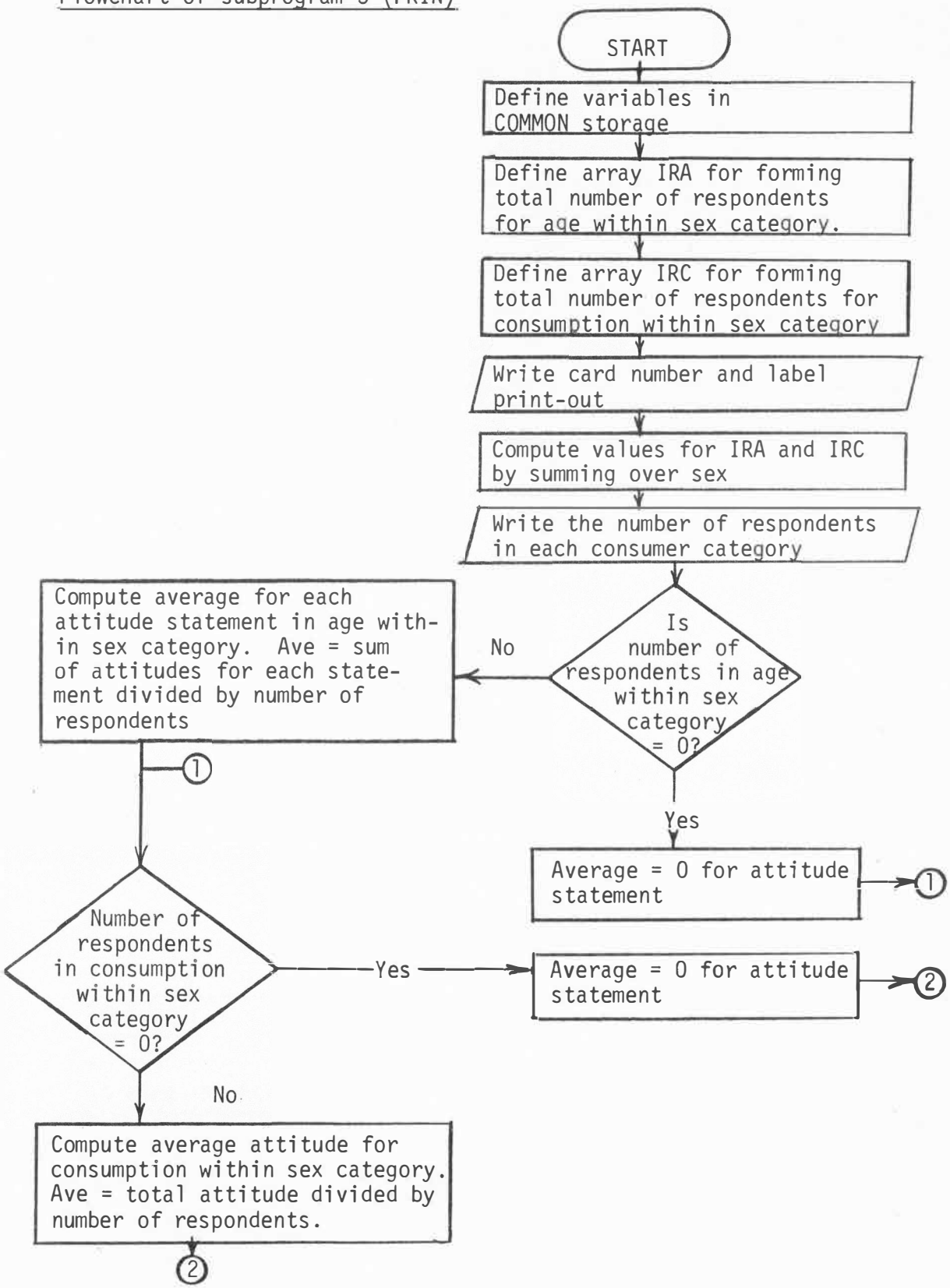
Flowchart of subprogram I (INV)

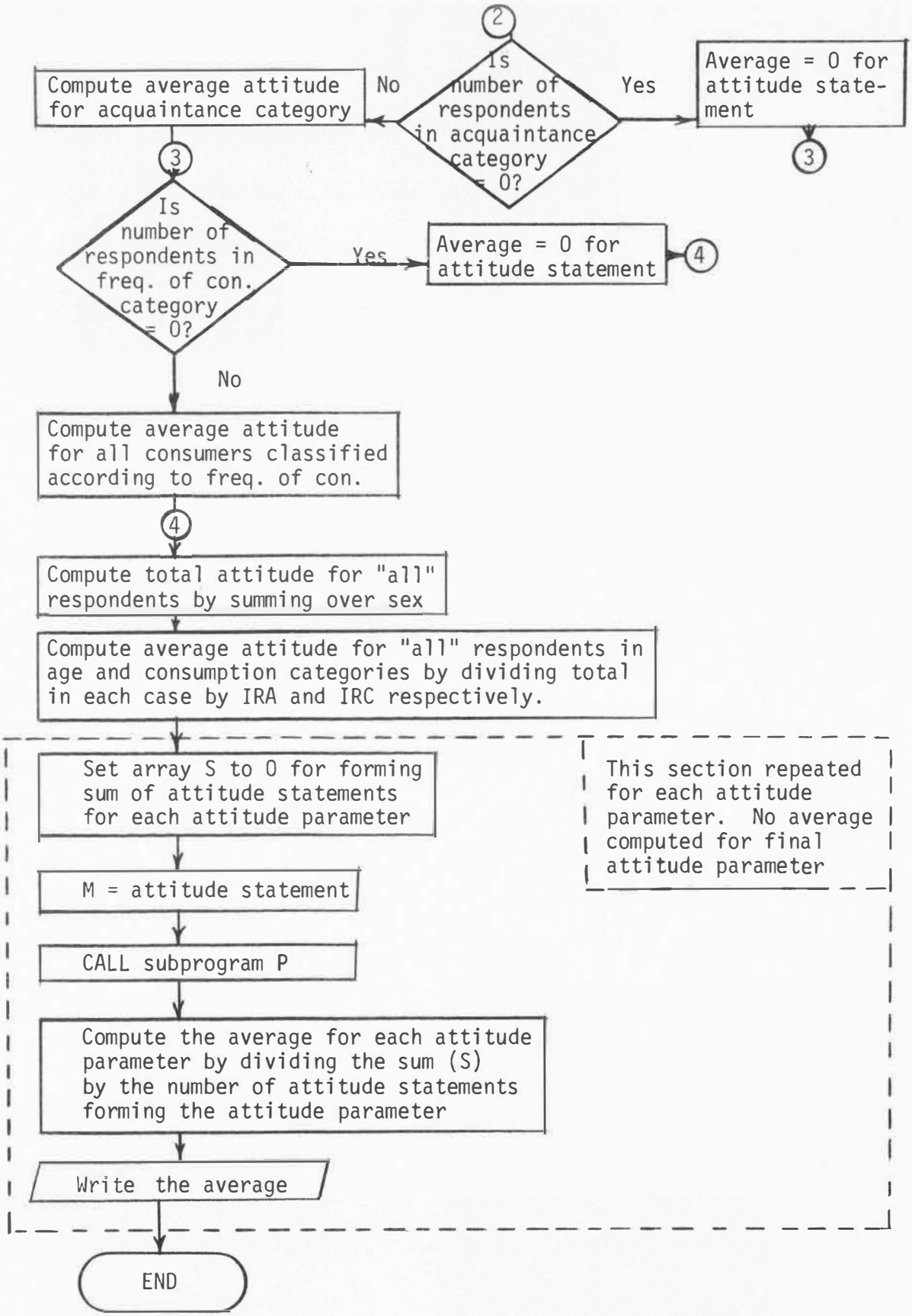


Flowchart of subprogram 2 (CALC)

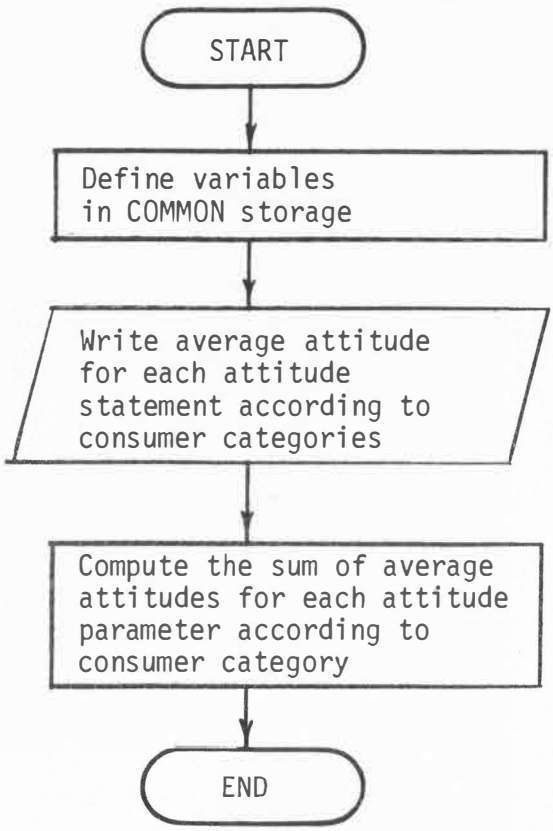


Flowchart of subprogram 3 (PRIN)




2
Is number of respondents in acquaintance category = 0?
No
Yes
Average = 0 for attitude statement
3
Compute average attitude for acquaintance category
3
Is number of respondents in freq. of con. category = 0?
Yes
Average = 0 for attitude statement
4
No
Compute average attitude for all consumers classified according to freq. of con.
4
Compute total attitude for "all" respondents by summing over sex
Compute average attitude for "all" respondents in age and consumption categories by dividing total in each case by IRA and IRC respectively.
Set array S to 0 for forming sum of attitude statements for each attitude parameter
M = attitude statement
CALL subprogram P
Compute the average for each attitude parameter by dividing the sum (S) by the number of attitude statements forming the attitude parameter
Write the average
This section repeated for each attitude parameter. No average computed for final attitude parameter
END

Flowchart for subprogram 4 (P)



Appendix N

Program II - Main Program

```
    CONSUMER CONSUMPTION OF FLUID MILK PRODUCTS  PROGRAM NO. 2
    COMMON IV(30),AGE(2),SUM(2,3,7,30),NR(2,3,7,30),AVE(2,3,7,30),S(7)
   1,NS(7),WA(7),ICN,N,M,TGC,JI
    DO 800 NIX=1,5
    DO 45 I=1,2
    AGE(I)=0.0
    DO 45 J=1,3
    DO 45 K=1,7
    DO 45 L=1,30
    SUM(I,J,K,L)=0.0
 45 NR(I,J,K,L)=0
    DO 500 J=1,360
    READ(5,100)ICN,IAGE,ISEX,IV,TGC
100 FORMAT(6X,I2,1X,I2,I1,12X,30I1,12X,F3.2)
    DO 98 JO=1,30
    IF(IV(JO).NE.0)GO TO 98
    IV(JO)=4
 98 CONTINUE
    JI=ISEX
    CALL INV
    IF(IAGE.LE.19)GO TO 20
    IF(IAGE.LE.34)GO TO 21
    AGE(JI)=3.
    GO TO 30
 20 AGE(JI)=1.
    GO TO 30
 21 AGE(JI)=2.
 30 CALL CALC
500 CONTINUE
    CALL PRIN
800 CONTINUE
    END
```

Appendix O

Program II - Subprogram 1

```
 SUBROUTINE INV
 COMMON IV(30),AGE(2),SUM(2,3,7,30),NR(2,3,7,30),AVE(2,3,7,30),S(7)
1,NS(7),WA(7),ICN,N,M,TGC,JI
 DIMENSION IA(7)
 DATA IA/7,6,5,4,3,2,1/
 K1=IV(2)
 K2=IV(3)
 K3=IV(7)
 K4=IV(8)
 K5=IV(9)
 K6=IV(11)
 K7=IV(13)
 K8=IV(17)
 K9=IV(19)
 K10=IV(20)
 K11=IV(21)
 K12=IV(24)
 K13=IV(25)
 K14=IV(28)
 K15=IV(29)
 K16=IV(30)
 IV(2)=IA(K1)
 IV(3)=IA(K2)
 IV(7)=IA(K3)
 IV(8)=IA(K4)
 IV(9)=IA(K5)
 IV(11)=IA(K6)
 IV(13)=IA(K7)
 IV(17)=IA(K8)
 IV(19)=IA(K9)
 IV(20)=IA(K10)
 IV(21)=IA(K11)
 IV(24)=IA(K12)
 IV(25)=IA(K13)
 IV(28)=IA(K14)
 IV(29)=IA(K15)
 IV(30)=IA(K16)
 RETURN
 END
```

Appendix P

Program II - Subprogram 2

```
      SUBROUTINE CALC
      COMMON IV(30),AGE(2),SUM(2,3,7,30),NR(2,3,7,30),AVE(2,3,7,30),S(7)
     1,NS(7),WA(7),ICN,N,M,TGC,JI
      N=AGE(JI)
      DO 41 L=1,30
      K=IV(L)
      SUM(JI,N,K,L)=SUM(JI,N,K,L)+TGC
   41 NR(JI,N,K,L)=NR(JI,N,K,L)+1
      RETURN
      END
```

Appendix Q

Program II - Subprogram 3

```
      SUBROUTINE PRIN
      COMMON IV(30),AGE(2),SUM(2,3,7,30),NR(2,3,7,30),AVE(2,3,7,30),S(7)
     1,NS(7),WA(7),ICN,N,M,TGC,JI
      KZ=0
      WRITE(6,109)ICN
  109 FORMAT(1H1,47X,'CONSUMER ATTITUDE TOWARD MILK 2'//52X,'RONDO CHRIS
     ITENSEN',I3//)
      WRITE(6,110)
  110 FORMAT(50X,'TABLE 1 MALES AGE 15-19',/)
      WRITE(6,111)
  111 FORMAT(1X,'        1                 2                 3
     1       4                 5                 6                 7')
      WRITE(6,112)
  112 FORMAT(2X,'NO. RES  AVE CON  NO. RES  AVE CON  NO. RES  AVE CON  N
     1O. RES  AVE CON  NO. RES  AVE CON  NO. RES  AVE CON  NO. RES  AVE
     2CON',/)
      DO 23 JI=1,2
      DO 23 N=1,3
      DO 23 K=1,7
      DO 23 L=1,30
      IF(NR(JI,N,K,L).EQ.0)GO TO 83
      AVE(JI,N,K,L)=SUM(JI,N,K,L)/NR(JI,N,K,L)
      GO TO 23
   83 AVE(JI,N,K,L)=0.0
   23 CONTINUE
      JI=1
      N=1
  875 DO 26 I=1,7
      NS(I)=0
   26 S(I)=0.0
      M=3
      CALL P
      M=8
      CALL P
      M=9
      CALL P
      M=16
      CALL P
      M=20
      CALL P
      M=27
      CALL P
      DO 301 JA=1,7
      IF(NS(JA))15,300,15
  300 WA(JA)=0.0
      GO TO 301
   15 WA(JA)=S(JA)/NS(JA)
```

```
301 CONTINUE
    WRITE(6,133)
133 FORMAT(51X,'WEIGHTED AVERAGES',/)
    WRITE(6,105)(NS(JA),WA(JA),JA=1,7)
105 FORMAT(1X,7(I6,F12.3),////)
    DO 28 I=1,7
    NS(I)=0
 28 S(I)=0
    M=4
    CALL P
    M=5
    CALL P
    M=10
    CALL P
    M=11
    CALL P
    M=17
    CALL P
    M=21
    CALL P
    DO 303 JA=1,7
    IF(NS(JA))16,302,16
302 WA(JA)=0.0
    GO TO 303
 16 WA(JA)=S(JA)/NS(JA)
303 CONTINUE
    WRITE(6,133)
    WRITE(6,105)(NS(JA),WA(JA),JA=1,7)
    DO 99 I=1,7
    NS(I)=0
 99 S(I)=0.0
    M=19
    CALL P
    M=28
    CALL P
    M=29
    CALL P
    M=30
    CALL P
    DO 305 JA=1,7
    IF(NS(JA))29,304,29
304 WA(JA)=0.0
    GO TO 305
 29 WA(JA)=S(JA)/NS(JA)
305 CONTINUE
    WRITE(6,133)
    WRITE(6,105)(NS(JA),WA(JA),JA=1,7)
    DO 30 I=1,7
    NS(I)=0
 30 S(I)=0.0
    M=7
    CALL P
```

```
      M=13
      CALL P
      DO 307 JA=1,7
      IF(NS(JA))31,306,31
  306 WA(JA)=0.0
      GO TO 307
   31 WA(JA)=S(JA)/NS(JA)
  307 CONTINUE
      WRITE(6,133)
      WRITE(6,105)(NS(JA),WA(JA),JA=1,7)
      M=6
      CALL P
      WRITE(6,134)
  134 FORMAT(50X,'NO WEIGHTED AVERAGES',////)
      M=14
      CALL P
      WRITE(6,134)
      DO 34 I=1,7
      NS(I)=0
   34 S(I)=0.0
      M=24
      CALL P
      M=25
      CALL P
      M=15
      CALL P
      M=18
      CALL P
      M=22
      CALL P
      M=23
      CALL P
      M=26
      CALL P
      M=1
      CALL P
      M=2
      CALL P
      M=12
      CALL P
      KZ=KZ+1
      IF(KZ.EQ.12)GO TO 79
      WRITE(6,134)
      GO TO(80,81,82,84,85,86,87,88,89,90,91),KZ
   80 N=2
      WRITE(6,204)
  204 FORMAT(1H1,49X,'TABLE 2 MALES AGE 20-34',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   81 N=3
      WRITE(6,205)
  205 FORMAT(1H1,49X,'TABLE 3 MALES AGE 35-OVER',/)
      WRITE(6,111)
```

```
      WRITE(6,112)
      GO TO 875
   82 JI=2
      N=1
      WRITE(6,206)
  206 FORMAT(1H1,49X,'TABLE 4 FEMALES AGE 15-19',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   84 N=2
      WRITE(6,207)
  207 FORMAT(1H1,49X,'TABLE 5 FEMALES AGE 20-34',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   85 N=3
      WRITE(6,208)
  208 FORMAT(1H1,49X,'TABLE 6 FEMALES AGE 35-OVER',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   86 DO 98 N=1,3
      DO 98 K=1,7
      DO 98 L=1,30
      SUM(1,N,K,L)=SUM(1,N,K,L)+SUM(2,N,K,L)
      NR(1,N,K,L)=NR(1,N,K,L)+NR(2,N,K,L)
      IF(NR(1,N,K,L).NE.0)GO TO 49
      AVE(1,N,K,L)=0.0
      GO TO 98
   49 AVE(1,N,K,L)=SUM(1,N,K,L)/NR(1,N,K,L)
   98 CONTINUE
      JI=1
      N=1
      WRITE(6,210)
  210 FORMAT(1H1,49X,'TABLE 7 ALL AGE 15-19',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   87 N=2
      WRITE(6,211)
  211 FORMAT(1H1,49X,'TABLE 8 ALL AGE 20-34',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   88 N=3
      WRITE(6,212)
  212 FORMAT(1H1,49X,'TABLE 9 ALL AGE 35-OVER',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   89 DO 50 N=1,3
```

```
      DO 50 K=1,7
      DO 50 L=1,30
      SUM(1,N,K,L)=SUM(1,N,K,L)-SUM(2,N,K,L)
   50 NR(1,N,K,L)=NR(1,N,K,L)-NR(2,N,K,L)
      DO 151 K=1,7
      DO 151 L=1,30
      SUM(1,1,K,L)=SUM(1,1,K,L)+SUM(1,2,K,L)+SUM(1,3,K,L)
      SUM(2,1,K,L)=SUM(2,1,K,L)+SUM(2,2,K,L)+SUM(2,3,K,L)
      NR(1,1,K,L)=NR(1,1,K,L)+NR(1,2,K,L)+NR(1,3,K,L)
      NR(2,1,K,L)=NR(2,1,K,L)+NR(2,2,K,L)+NR(2,3,K,L)
      IF(NR(1,1,K,L).NE.0)GO TO 51
      AVE(1,1,K,L)=0.0
      GO TO 412
   51 AVE(1,1,K,L)=SUM(1,1,K,L)/NR(1,1,K,L)
  412 IF(NR(2,1,K,L).NE.0)GO TO 413
      AVE(2,1,K,L)=0.0
      GO TO 151
  413 AVE(2,1,K,L)=SUM(2,1,K,L)/NR(2,1,K,L)
  151 CONTINUE
      JI=1
      N=1
      WRITE(6,218)
  218 FORMAT(1H1,49X,'TABLE 10 MALES ALL AGES',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   90 JI=2
      WRITE(6,213)
  213 FORMAT(1H1,49X,'TABLE 11 FEMALES ALL AGES',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   91 DO 92 K=1,7
      DO 92 L=1,30
      SUM(1,1,K,L)=SUM(1,1,K,L)+SUM(2,1,K,L)
      NR(1,1,K,L)=NR(1,1,K,L)+NR(2,1,K,L)
      IF(NR(1,1,K,L).NE.0)GO TO 52
      AVE(1,1,K,L)=0.0
      GO TO 92
   52 AVE(1,1,K,L)=SUM(1,1,K,L)/NR(1,1,K,L)
   92 CONTINUE
      JI=1
      N=1
      WRITE(6,214)
  214 FORMAT(1H1,49X,'TABLE 12 ALL AGE GROUPS',/)
      WRITE(6,111)
      WRITE(6,112)
      GO TO 875
   79 CONTINUE
      RETURN
      END
```

Appendix R

Program II - Subprogram 4

```
      SUBROUTINE P
      COMMON IV(30),AGE(2),SUM(2,3,7,30),NR(2,3,7,30),AVE(2,3,7,30),S(7)
     1,NS(7),WA(7),ICN,N,M,TGC,JI
      WRITE(6,100)(NR(JI,N,K,M),AVE(JI,N,K,M),K=1,7)
  100 FORMAT(1X,7(I6,F12.3),/)
      DO 15 K=1,7
      S(K)=S(K)+NR(JI,N,K,M)*AVE(JI,N,K,M)
   15 NS(K)=NS(K)+NR(JI,N,K,M)
      RETURN
      END
```

Appendix S

Table Numbers and Associated Consumer Category Breakdown for Program II

Table Number	Consumer Category
1	Males - Age 15-19
2	Males - Age 20-34
3	Males - Age 35-Over
4	Females - Age 15-19
5	Females - Age 20-34
6	Females - Age 35-Over
7	All Respondents - Age 15-19
8	All Respondents - Age 20-34
9	All Respondents - Age 35-Over
10	Males - All Age Groups
11	Females - All Age Groups
12	All Respondents - All Age Groups

Appendix T

Sample of Program II Output

CONSUMER ATTITUDE TOWARD MILK 2

RONDO CHRISTENSEN 51

Attitude Parameter - Nutrition-Vitality

TABLE 1 MALES AGE 15-19

	1		2		3		4		5		6		7	
	RES[a]	CON[b]	RES	CON	RES	CON	RES	CON	RES	CON	RES	CON	RES	CON
Vitamins[c]	0	0.0	0	0.0	0	0.0	2	3.0	0	0.0	3	5.667	9	5.333
Nutrition	0	0.0	0	0.0	0	0.0	1	3.0	0	0.0	3	6.333	10	4.900
Protein	1	4.0	0	0.0	0	0.0	1	3.0	1	4.0	2	7.000	9	5.111
Calcium	1	4.0	0	0.0	0	0.0	4	3.5	0	0.0	2	4.500	7	6.286
Energy	1	4.0	0	0.0	0	0.0	4	4.5	2	4.5	1	9.000	6	5.167
Vitality	1	3.0	0	0.0	0	0.0	4	4.5	0	0.0	3	4.333	6	6.167
WEIGHTED AVERAGES														
	4	3.75	0	0.0	0	0.0	16	3.875	3	4.333	14	5.786	47	5.426

Attitude Parameter - Taste-Refreshment

	1		2		3		4		5		6		7	
	RES	CON	RES	CON	RES	CON	RES	CON	RES	CON	RES	CON	RES	CON
Children	0	0.0	0	0.0	0	0.0	1	3.000	1	4.0	0	0.000	12	5.333
Taste	0	0.0	0	0.0	0	0.0	1	3.000	0	0.0	2	4.000	11	5.455
Watery; Rich	1	3.0	0	0.0	0	0.0	6	5.000	0	0.0	3	4.667	4	6.000
Adults	0	0.0	1	4.0	1	4.0	3	3.333	0	0.0	1	6.000	8	5.875
Entire Family	0	0.0	0	0.0	0	0.0	1	3.000	0	0.0	1	9.000	12	4.917
Refreshing	0	0.0	0	0.0	0	0.0	3	4.000	0	0.0	0	0.000	11	5.364
WEIGHTED AVERAGES														
	1	3.0	1	4.0	1	4.0	15	4.067	1	4.0	7	5.286	58	5.397

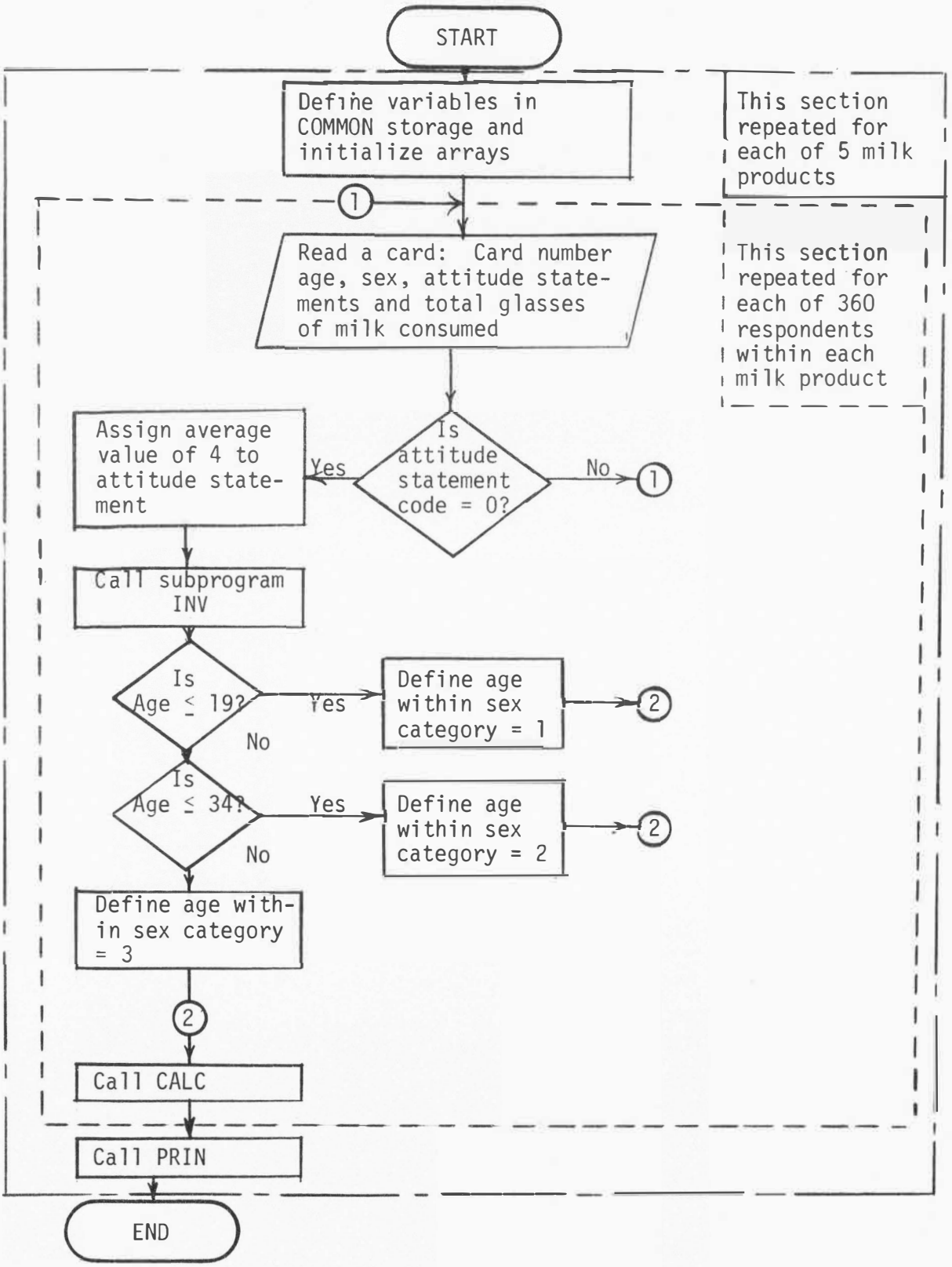
Note: [a]RES = Number of respondents

[b]CON = Average consumption

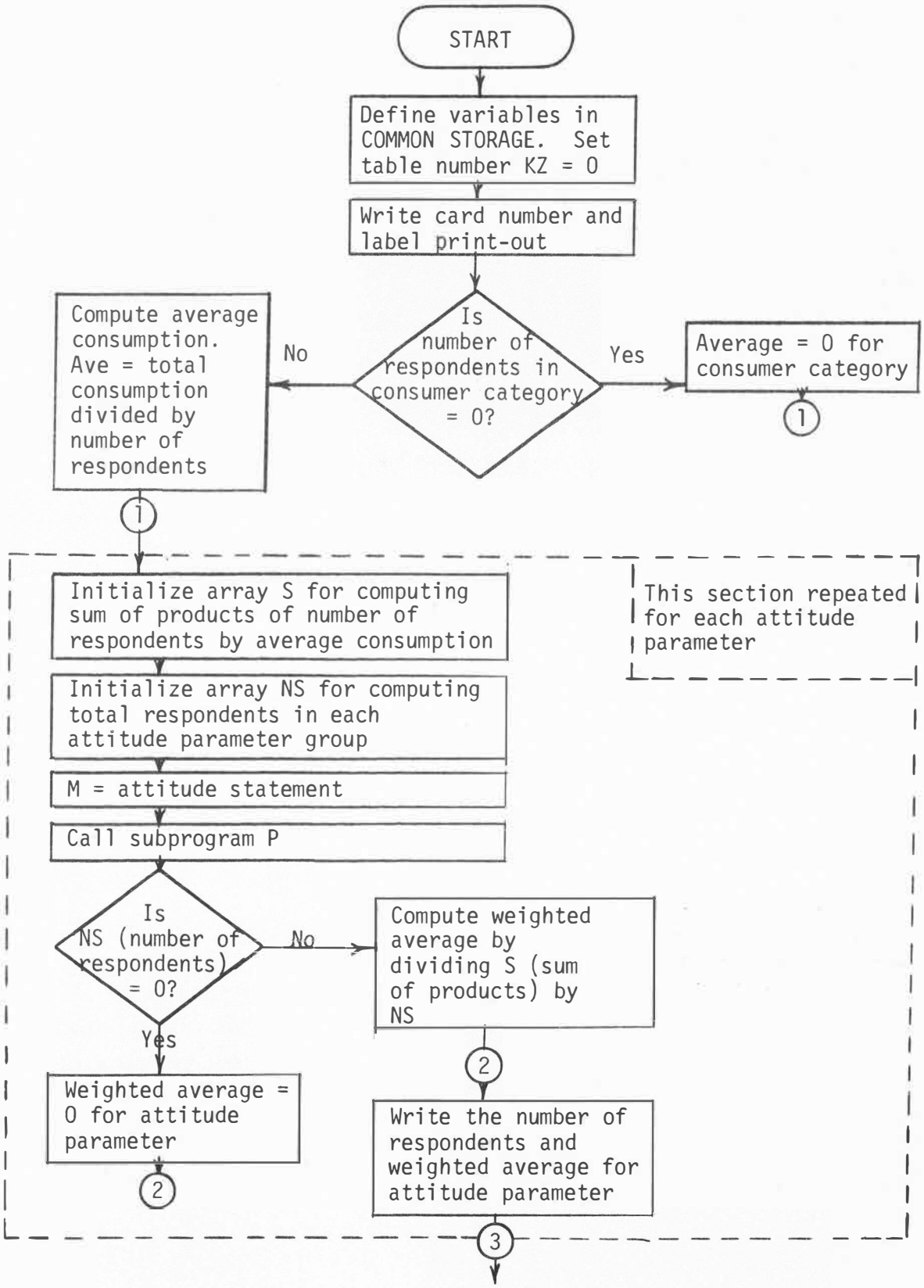
[c]The documentation on the left margin is not included as a part of the computer output.

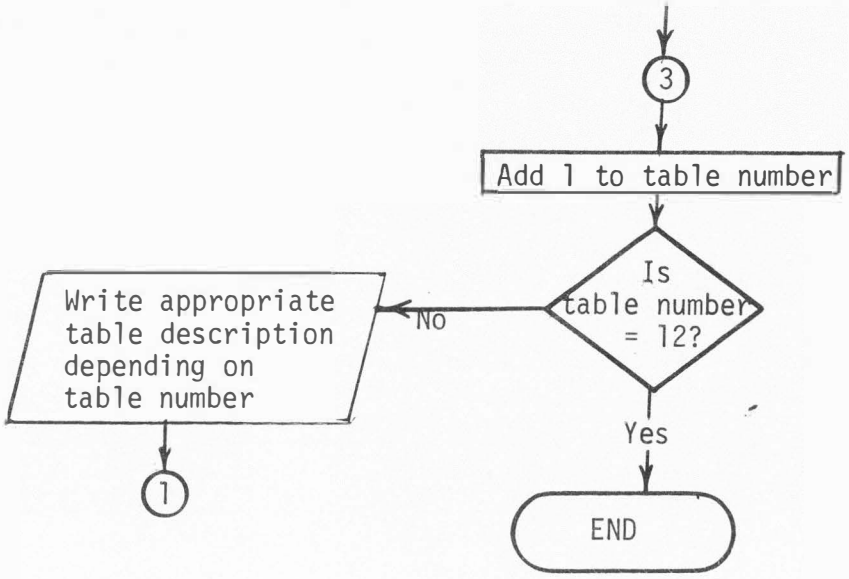
Appendix U

Program II - Flowchart

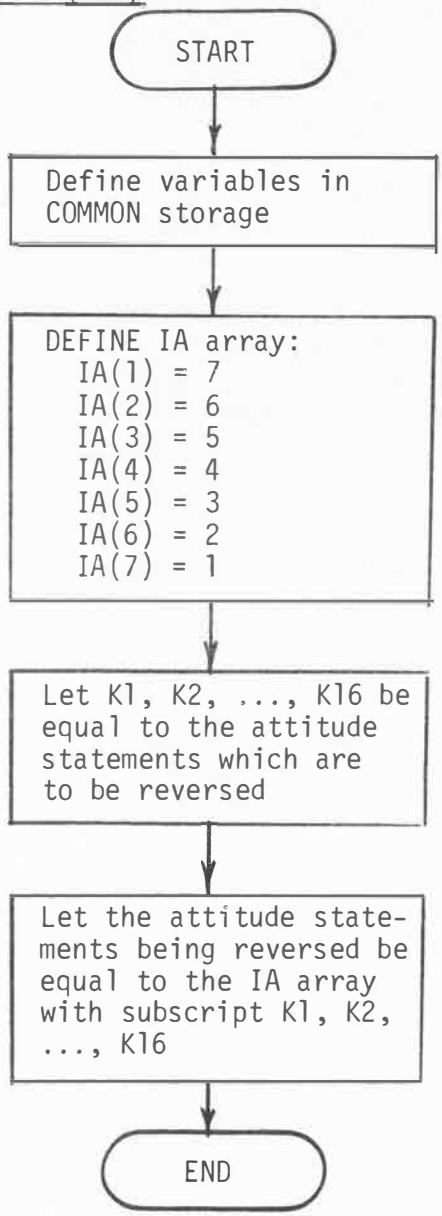


Flowchart of subprogram 3 (PRIN)

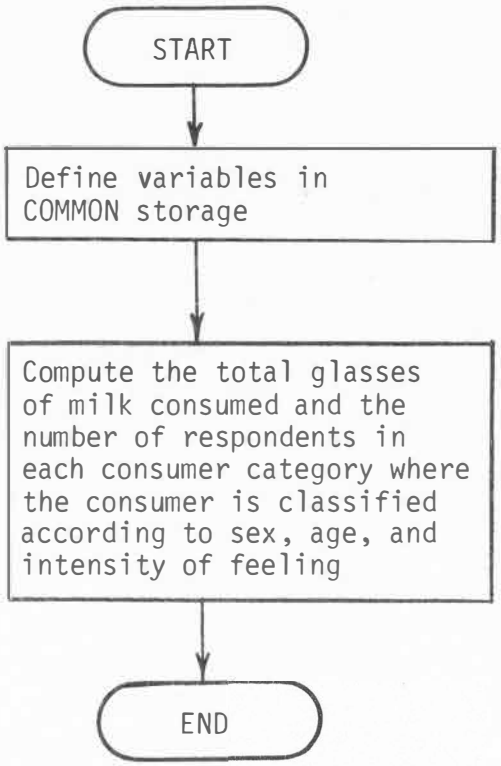



3
Add 1 to table number
Is table number = 12?
No
Write appropriate table description depending on table number
1
Yes
END

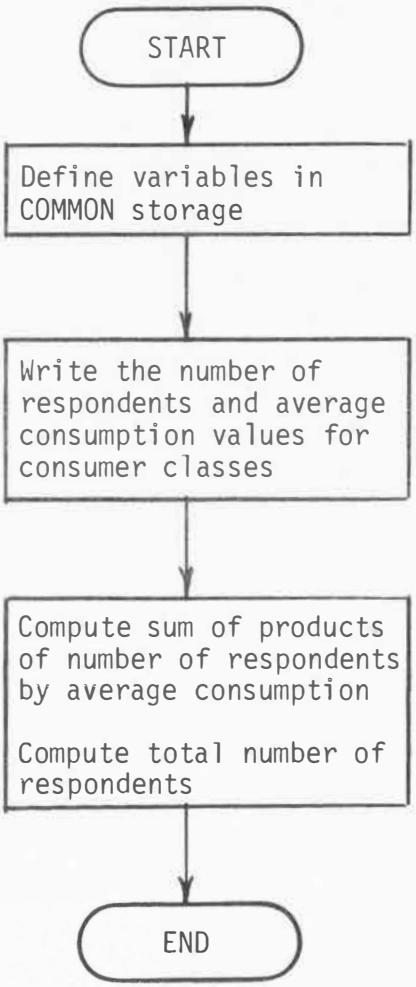
Flowchart of subprogram I (INV)



Flowchart of subprogram 2 (CALC)



Flowchart for subprogram 4 (P)



Appendix V

Description of Symbols Used in Program I

Symbol	Description
Age	Defines an array used to categorize the consumer into age group according to sex.
AVACQ	Array for computation of average intensity of feeling for acquaintance category.
AVCON	Array for computation of average intensity of feeling for consumption within sex category.
AVEA	Array for computation of average intensity of feeling for age within sex category.
AVFOC	Array for computation of average intensity of feeling for frequency of consumption category.
Con	Defines an array used to categorize the consumer into consumption group according to sex.
IA	Array used in rescaling attitude statement values.
IAGE	Age of the consumer.
IC	Classification for the amount of consumption.
ICN	Card number read on input defining the milk product.
IRA	Array of total respondents summed over sex for age within sex category.
IRC	Array of total respondents summed over sex for consumption within sex category.
ISEX	Sex of the consumer.
IV	Array of attitude statements.
IV(1)	Acquaintance with product variable.
IV(2)	Frequency of consumption variable.
JI	Variable equivalent to sex value.
JO	Index of a DO loop used to check for an attitude statement value of zero.

Symbol	Description
M	As used in subprogram "PRIN," M represents a particular attitude statement. Its function is to rearrange the attitude statements for print-out according to the attitude parameter to which they belong.
M	As used in subprogram "CALC," M defines consumption within sex category.
N	Defines age within sex category.
NN	Acquaintance category.
NO	Frequency of consumption category.
NR	Array for accumulating total respondents for age within sex category.
NRS	Array of respondent totals for consumption within sex category.
NS	Array of respondent totals for frequency of consumption category.
NZ	Array of respondent totals for acquaintance category.
S	Array used to accumulate the sum of the average intensity of feeling values for use in computation of the attitude parameter group means.
SUM	Array used to accumulate total of the attitude statements for age within sex category.
SUX	Array of attitude statement totals for consumption within sex category.
SUY	Array of attitude statement totals for acquaintance category.
SUZ	Array of attitude statement totals for frequency of consumption category.

Appendix W

Description of Symbols Used in Program II

Symbol	Description
AGE	Defines an array used for categorizing the consumer into age group according to sex.
AVE	Array used to compute average consumption for consumers classified by sex, age, and intensity of feeling.
IA	Array used in rescaling attitude statements.
IAGE	Age of consumer.
ICN	Card number identifying the product.
ISEX	Sex of consumer.
IV	Array of attitude statements.
JI	Variable equivalent to sex value.
JO	Index of DO loop used in checking for an attitude statement value of zero.
K	Variable used to classify each attitude statement.
KZ	Table number.
M	Represents a particular attitude statement. It is used to rearrange the attitude statements according to the attitude parameter group to which they belong for print-out purposes.
N	Defines age within sex category.
NR	Array of total respondents for consumers categorized by sex, age, and intensity of feeling.
NS	An array which accumulates the total number of respondents according to the attitude parameter group for a particular consumer class.
S	An array used in computations necessary for obtaining weighted averages. It contains the sum of the product of the number of respondents by average consumption.

Symbol	Description
SUM	Array used to accumulate total consumption for consumers classified according to sex, age, and intensity of feeling.
TGC	Total glasses of milk consumed.
W	An array of weighted averages for each attitude parameter group.

VITA

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