COMPREHENSIVE RESEARCH ON RICE

PROGRAM AREA _____ Products Development and Consumer Preference _____

PROJECT NUMBER & TITLE _____ Consumer Attitudes Towards Types and Forms of _____

Rice and Palatability Variables [E-1] _____

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Objectives

The goals of this past year's activity were to determine consumers' preferences with respect to existing rice products, potential rice products, and rice substitute products. A preference pattern study was employed to establish a preference ranking of products. Complementing this was an exploration of the degree to which preparation plays a role in consumers' attitude toward a particular rice which they are using. Consumption and choice of product are most likely affected by attitudes and preferences, thus the import of the research was to define the parameters of these variables.

Experiments Completed

The preference pattern study is now in the final stages of analysis. This study concerned itself with consumers' preference for rices and rice substitutes. Information was also collected on consumers frequency of rice use, and the type and name of the rice they use. The questionnaire also included questions about the respondent's family size, income, and other demographic information. Subjects were from Northern and Southern California, totalling 201 in all. They were asked to rank 25 food items according to "how well they liked" each by ordering a deck of cards with separate items on each. This deck when so ranked represented a hierarchy of preferences for each individual.

Included in the items list were 7 different types of rices (varying grain lengths and processing methods), and 13 were descriptions of potential rice products. These latter products were developed by modifying the basic product rice by adjectives thought to enhance or detract from the desirability of rice as a product, such as "a tasty rice". These descriptions were formulated on the basis of data obtained from studies previously completed in this project (the rice sensory experiment and the consumers' attitude study which deals with the appropriateness of rice for various uses). Completing the list were four rice substitutes and one item which read "the rice you use most often" (Table 1--item list).

Preference Study Results

Mean ranks were computed for the items across the 201 subjects (see Table 1). As contained in Table 1, the top four items receiving the best ranks were rice descriptions (the lower the score the better it was liked). Following these were baked potato and long grain rice. Overall most of the descriptions of rice products did well, being preferred items. Items ranking lowest were medium grain rice, short grain rice, chewy compact rice and parboiled rice in descending order. It is important to note that California rice products when specified by non-brand identification (short and medium grain rice) do poorly in the rankings.

Share scores were also obtained. The share score is a percentage that represents the number of people who chose a particular item over the brand they are currently using. So for each item there is a share ratio indicating the desirability of it above the item number 10 "the rice you use most often" (see Table 1). The four top descriptions have share scores in the 60% range, indicating that 60% of our population preferred these products to the "rice they use most often". At the other extreme only 20.9% of our population preferred "a chewy compact rice" to the "rice they use most often". The share scores for existing rice products may be misleading since the products they are currently using may be similar or the same as a product they might prefer. For example, the share scores for long grain rice is probably misleading since some of the products they are using probably are long grain rices.

Draw ratio were also obtained. In this study the draw ratio indicates what percentage of those using a certain type of rice now (e.g. boxed rice) prefer a particular product description over the item "the rice you use most often". As seen in Table 2, of the 86 boxed rice long grain users, 44% of them chose description number 9 over the item "the rice you use most often" giving a draw ratio of 51.2%. It is not a valid assumption to conclude that the rice consumers have on hand is the rice they use most often, but it is likely to be the case. We do have some evidence to support this conjecture. When respondents were asked if they had used any other grain length of rice this year 64.2% of them gave no answer. When asked the name brand of any other rice used in the past year 66.7% gave no answer, indicating that for two-thirds of the population the rice they have on hand is the product used most consistently.

The population itself was predominantly white (93.5%), city dwellers (84.1%), in the middle to upper middle income bracket, 86.5% having incomes over $9,000 and up, fairly well educated, 98.6% high school or more, and most were housewives (62.7%). Most of the respondents had children (77.1%), spending between $10 - $50 on food (88.1%).

Rice was served more than once a month by 38.8% of the group and weekly by 53.7% of the group. The rice reported on hand with the most frequency was Minute Rice (23.9%), Uncle Ben's products (23.4%), and MJB products (20.4%) in descending order.

Long grain rice is the product most likely to be on hand in the home. Considering all rices, the grain lengths reported on hand were: long grain - 73.6%, medium grain - 11.9%, and short grain - 10.0%. The results are consistent with general trends in that long grain appears to be the most popular rice with white American housewives. The results also indicate that

descriptions of appealing rice products (potential products) are preferred to even long grain rice and potatoes. It seems likely that short or medium grain rices exist or could be produced which capitalize upon such descriptions through promotion or product development.

Rice Preparation Study

Analysis is underway of the rice preparation study conducted late this summer. Northern California housewives were asked to cook and evaluate in their own homes two different rices (long grain rice vs. medium grain rice) under two different sets of cooking instructions. The experimental design was a blind 2x2x2 factual matrix counter balancing for rice, cooking instructions and order. This study may help to define the role played by preparation as it influences consumer satisfaction with the finished product. In this study preparation occurs without the confounding influences of package design and advertisement.

In this situation the evaluation of each rice will depend only on the rice and its preparation. This hopefully will prove to be a insightful and revealing study; the results will be forthcoming shortly.

Work Planned

Several studies are planned for the remaining part of this year. Small group interviews of housewives of children of various ages will be conducted. The groups will represent different levels of rice consumption and from these hopefully information will be obtained about total useage, preparation, and factors which may facilitate rice consumption.

Another study planned for the coming year is a rice sensory-attribute preference study using men and children as subjects. Comparing these date with the data already obtained for women may reveal the interactions between the groups that contribute to or attenuate the rate of consumption of rice.

Important to producers and marketing people is the influence of the appearance attributes of the product before cooking and the influence of the package it comes in. The final evaluation of the product when cooked may be prejudiced by these. To specify these variables a study is planned to examine in detail the ramifications of these variables.

Running concurrently with these studies will be continuation of the investigation of rice "people types". What is the heavy rice user like in terms of social background, education, income, etc.

Major Accomplishments

Paramount to this year's activity was the construction of a preference hierarchy revealing the position of actual rice products, potential rice products and rice substitutes in the minds of a sample of California consumers. The success of the potential rice products over established products indicates the consumers willingness to prefer and presumably purchase products that may have qualities they find missing in the products they are currently using.

Applicable Results

It would seem fruitful to use promotionally and in product development those descriptions found to be highly desireable by consumers.

Evaluation of Project

In the opinion of the investigators the work on this project appears to be leading to information which can contribute to the increased consumption of California rice.

Publications and Reports

The sensory study of cooked rice will be presented at the Institute of Food Technologists Annual Meeting in June 1973. Following this presentation it will be published in the Journal of Food Science. The attitude study on rice is being prepared for the Agriculture Extension Bulletin. A summary of both of these appears in the Proceedings of the Rice Technical Work Group, the meeting held at Davis, 1972.

TABLE 1

Summary of Rice Preference Study

Rank	Mean[1]	Share[2]	Item Number	
1	9.0	60.2%	1	A tasty rice
2	9.4	60.7	2	A rice that turns out right every time
3	9.5	60.7	3	A light fluffy rice
3	9.5	60.7	4	A rice that balances the meal nutritionally
4	9.7	58.2	5	Baked potato
5	10.7	54.7	6	Long grain rice
6	10.7	53.2	7	A rice good enough to serve to guests
7	10.9	45.3	8	A rice that goes well with all meats
7	10.9	53.7	9	A rice that is quick and simple to cook
8	11.4		10	The rice you use most often
9	11.9	47.8	11	A rice for all occasions
10	12.0	48.8	12	A rice that adds variety to your meals
11	12.5	43.8	13	Steamed rice
12	12.7	44.3	14	Enriched rice
13	13.5	38.8	15	A rice children would like
14	13.9	41.3	16	A rice that looks good on the plate
14	13.9	39.3	17	Mashed potatoes
15	14.4	38.3	18	Brown rice
16	14.8	35.3	19	Macaroni
17	15.3	36.8	20	French fries
18	16.4	30.3	21	A hardy filling rice
19	16.6	26.4	22	Medium grain rice
20	17.1	23.4	23	Short grain rice
21	19.2	20.9	24	A chewy compact rice
22	19.3	19.4	25	Parboiled rice

[1] The mean represents the average preference rank (1 best, 22 worst) given to each item by the total 201 persons.

[2] The share score is the percentage of people who prefer a particular item better than the item, "the rice you use most often".

TABLE 2

Draw Scores for the Rice Preference Study[1]

Item No.	Item	Long Grain Boxed Rice (Long cooking time)	Long Grain Boxed Rice (short cooking time)	Long Grain Bulk White	Med. Grain Bulk White	Short Grain Bulk White	Bulk Brown Rice
(9)	A rice quick & simple to cook	44/86=51.2%	39/50=78.0%	10/33=30.3%	2/6=33.3%	3/5=60.0%	3/10=30.0%
(8)	A rice that goes well with all meats	34/86=40.0	26/50=52.0	16/33=48.5	3/6=50.0	2/5=20.0	2/10=20.0
(7)	A rice good enough to serve to guests	48/86=55.8	28/50=56.0	18/33=54.6	0/6=00.0	2/5=40.0	4/10=40.0
(24)	A chewy compact rice	13/86=15.1	8/50=16.0	7/33=21.2	2/6=33.3	2/5=40.0	8/10=80.0
(5)	A light fluffy rice	49/86=57.0	36/50=72.0	19/33=57.6	5/6=83.3	3/5=60.0	4/10=40.0
(12)	A rice that adds variety to your meals	37/86=43.0	27/50=54.0	16/33=48.5	2/6=33.3	4/5=80.0	5/10=50.0
(4)	A rice that balances the meal nutritionally	50/86=58.1	31/50=62.0	18/33=54.6	5/6=83.3	5/5=100.0	5/10=50.0
(11)	A rice for all occasions	42/86=48.4	23/50=46.0	16/33=48.5	2/6=33.3	1/5=20.0	5/10=50.0
(15)	A rice children would like	28/86=32.6	28/50=56.00	11/33=33.3	2/6=33.3	1/5=20.0	3/10=30.0
(21)	A hardy filling rice	23/86=26.7	16/50=32.0	8/33=24.2	2/6=33.3	2/5=40.0	5/10=50.0
(1)	A tasty rice	51/86=59.3	33/50=66.0	19/33=57.6	3/6=50.0	2/5=40.0	6/10=60.0
(2)	A rice that turns out right every time	54/86=62.8	33/50=66.0	19/33=57.6	4/6=66.7	3/5=60.0	4/10=40.0
(16)	A rice that looks good on the plate	34/86=39.5	24/50=48.0	12/33=36.4	3/6=50.0	1/5=20.0	4/10=40.0

[1]Draw Scores represent the percentage of those people using a particular product who prefer the particular description over the item "the rice you use most often". For example of those using long grain boxed rice of the instant type, 50 people, 39 of them prefer description number 9, "a rice quick and simple to cook" over "the rice you use most often". This results in a draw score of 78.0%. The numerators do not yield 100% because particular choices made by a subject do not exclude his representation in another draw score for another description. So an individual may be in all the draw scores or none.