research. For instance, Redman [8] estimated expenditure models for food away from home and prepared foods. She presumed that the woman would be the meal preparer and did not account for different characteristics of men as meal preparers. Prochaska and Schrimper [7] and Fletcher [1] estimated models for food away from home and food at home. Both allowed either males or females to be homemakers. Although they tested for differences between market-oriented and nonmarket-oriented households, they did not account for differences between meal preparers of different sexes or between non-wage-earning homemakers with and without wage-earning spouses. Therefore, major hypotheses of this paper were that meal preparers with different marketorientation and gender would exhibit different behavior, including different expenditure elasticities with respect to the value of time and different autonomous levels of use of convenience and nonconvenience foods.

From the theoretical model developed in Hull [6], the key demand determinants were specified, and hypotheses were formulated about the effects of these determinants on the household demand for convenience foods. One important result was that the expected sign of the elasticity of the value of time is indeterminate, and is dependent on the characteristics of the meal preparer.

The empirical version of the household demand functions has been specified as follows. Demand for market goods, M_i, can be expressed as a function of market prices, P_i, income, I, and value of time of the meal preparer, VOT. Other variables that enter the model are household characteristics that proxy for differences in labor productivity, human capital, physical capital, tastes and preferences, and environmental factors, E. The specification of this demand model is

$$M_i = d_i(P_1, \ldots, P_n, I, VOT, E) \qquad (1)$$

Four equations were estimated, one for each class of convenience and nonconvenience food.

VARIABLE SELECTION

The data used to estimate the models were from the 1977-78 Nationwide Food Consumption Survey (NFCS). The 1977-78 NFCS, containing food-use and expenditure data of households in the United States, used a stratified probability sample of households surveyed over four seasons: Spring 1977 through Winter 1978. The household survey included almost 15,000 households across the 48 contiguous states. Information was elicited on the kind, form, cost and quantity of each food used during the week prior to interview. Information on eating habits and socioeconomic and demographic characteristics such as the household age-sex composition, income and size was recorded as well. Only housekeeping households, defined as those households with at least one person having ten or more meals from the household supply during the survey period, were included in the estimation sample. Out of the 14,032 housekeeping

households 5,085 were deleted because data on the variables (mostly individuals' incomes) were either not available or reliable, or because they reported zero level of use of manufactured convenience foods. The final sample size for model estimation was 8,947 households.

Prices were not included explicitly in the statistical model. However, expected differences in prices between regions, seasons and urban settings were accounted for by including dummy variables for these effects. Money value of food used in each convenience class was chosen as the appropriate measure of consumption because this provided a means for aggregating foods into the broad convenience classes. The household meal preparer was the person for whom value of time was measured. In some cases, the male head was identified along with female head as meal preparer. In those cases, the female head was assumed to be the meal preparer.

Once the meal preparer was determined, a measure of value of time was needed. Theoretically, the value of time for an income earner would be the individual's wage (earned income per period divided by number of hours worked in the period). However, because computed hourly wages were unreasonable, the Fletcher method to measure value of time was chosen.

Fletcher [1] suggested that earnings are a proxy for the value of time. Net incomes and wages and salaries were converted to a weekly basis and combined to form the measure of earnings. This procedure provides a value of time proxy for meal preparers with earned income, but for those who do not work outside the home there is no such information reported. Fletcher [1] suggested that their market opportunity earnings be estimated using Heckman's sample selection bias procedure (Heckman [5]).[2]

Gronau [2] suggested that the potential wage of a nonworker was not important in determining the value of time for an individual. Instead, Gronau has shown that a nonmarket-oriented meal preparer's value of time would be pegged to the market wage of a wage-earning spouse. In this paper, for households with nonmarket-oriented meal preparers, but with a market-oriented other head of household, the earnings of the "other head" were used to proxy for value of time. Hence, dummy variables have been used as intercept- and slope-shifters (on the value of time proxy) to account for differences between (1) market-oriented meal preparers (those with earned income) (2) nonmarket-oriented meal preparers (those without earned income) without a wage-earning "other head" and (3) nonmarket-oriented meal preparers (those without earned income) with a wage-earning "other head" present, hereafter referred to as "half-market-oriented". Specific hypotheses about differences in slopes and intercepts have been tested. In addition to household size, income, earnings and characteristics of the meal preparers, other independent variables that entered the

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2See Hull [6] for procedure and results.

models were dummy variables for effects of region, season, race, urbanization, farm/nonfarm occupation and age-sex composition of the household.

The double-logrithamic functional form was chosen to estimate the study expenditure models for two main reasons. First, simple logarithmic transformation of dependent and independent variables allows the model to be estimated in linear form using ordinary least squares regression. Second, the parameters have desirable properties. Partial regression coefficients are estimates of elasticities. Also, when the estimated parameters for income and household size are between zero and one, and the functional form of the model is double logarithmic, the effects of variables are increasing at a decreasing rate (i.e. evidence of economies of scale and the classic Engel income relationship). The logarithm of the weekly money value of food within a class used by a household was the dependent variable for each model. The logarithms of income, household size and value of time (earnings) were used in the models as independent variables. Other independent variables were simply zero-one dummy variables.

The results of estimating each model using ordinary least squares regression are presented in TABLE 1. The F-statistics for all four models are highly significant, indicating that, overall, the independent variables significantly explain the variation in money value of food in each class used by households. The coefficient of determination is between .31 and .47 for all four models, which is moderate to good explanatory power for cross section data on such a large data base (8,947 households). Factors that could improve the explanatory power of the models include knowledge of the household's preferences, kitchen facilities, discretionary time, food and nonfood prices faced, dynamic consumption behavior and away-from-home food consumption.

VALUE OF TIME

Consideration of the value of time is unique to the theory of demand which has motivated the model of demand for convenience foods. Prochaska and Schrimper [7] reported positive value of time elasticities for expenditure on food away from home, with unemployed homemakers having smaller elasticities than employed homemakers. Fletcher [1] reported positive value of time elasticities for food away from home, negative for food at home. Neither Prochaska and Schrimper nor Fletcher allowed for differences by sex or half-market-orientation of meal preparers. The intercept shifts for meal preparers show that female meal preparers use more nonconvenience foods, and less convenience foods than male meal preparers. They also show that nonmarket-oriented meal preparers use more nonconvenience foods, and less convenience foods than market-oriented meal preparers. While this pattern may have been anticipated on casual observation alone, it is consistent with the theory given that men are expected to be less labor efficient than women at meal preparation, and wage-earners are expected

to have less discretionary time than non-wage-earners.

Table 2 shows how value of time elasticities compare across convenience foods for different attributes of the meal preparer. For the nonworking female meal preparer (i.e. the traditional housewife), the naive hypotheses about the value of time elasticities were verified: the higher the value of time, the more spent on convenience foods. Nonmarket-oriented females also use less nonconvenience foods, the higher their value of time. The less traditional types of meal preparers had different responses to changes in the value of time. Market-oriented male meal preparers (i.e. the working men) had value of time elasticities with signs that ran opposite to those for the nonmarket-oriented females. Market-oriented females and nonmarket-oriented males have characteristics which have offsetteng impacts on their value of time elasticities.

Several factors are offered as explanations of these patterns. Working males who are meal preparers tend to rely heavily on convenience foods regardless of their value of time. Their marginal utilities for convenience foods and marginal productivity in meal preparation using convenience foods may decline relative to the marginals for nonconvenience foods as their value of time increases. Also, these male meal preparers tend to represent small households where away-from-home food consumption may be a feasible substitute for at-home food consumption, as the value of time increases. Nonworking females tend to rely heavily on nonconvenience foods. As their value of time increases, they substitute the time-saving convenience foods for the time-using nonconvenience foods as expected. As more women enter the work force and more men become meal preparers, the market demand for convenience foods should increase.

INCOME AND HOUSEHOLD SIZE

The estimated income elasticities ranged from 0.03 in the nonconvenience food expenditure model to 0.08 in the complex convenience food model. The income elasticity for all food classes was hypothesized to fall between zero and one, since none of the food groups was considered an inferior good (with negative income elasticity) or a luxury good (with income elasticity greater than one). Naive hypotheses would use the typical income elasticities of food expenditure which fall between 0.17 and 0.3 as the expected range. However, those estimates of income elasticities came from models that did not account for the value of time. Those parameters have been hypothesized to be biased upward. All four income coefficients in the food expenditure models have been found significantly greater than zero and significantly less than 0.17, the most conservative estimate of the household income elasticity of expenditure for food at home reported by Salathe [9].

The significance of statistical tests on the range of income elasticities verifies that the food categories investigated are neither inferior nor

TABLE 1. Partial regression coefficients and standard errors[a] for models of household food expenditure on nonconvenience and basic, complex and manufactured convenience classes of food.

Independent Variable	Nonconvenience Food	Basic Convenience Food	Complex Convenience Food	Manufactured Convenience Food
Intercept	1.6393 (0.1708)	1.3366 (0.2335)	1.0793 (0.2328)	−0.2111 (0.3019)
Intercept shifts for meal preparers:				
Non-market-oriented	0.4410 (0.2416)	−1.3770 (0.3303)	−0.6736 (0.3293)	−0.6813 (0.4270)
Half-market-oriented	−0.1633 (0.1119)	−0.4316 (0.1530)	−0.0288 (0.1526)	−0.4738 (0.1978)
Female	0.4423 (0.1752)	−0.4957 (0.2395)	−0.5339 (0.2389)	−0.3343 (0.3097)
Log (value of time)	0.0907 (0.0323)	−0.1000 (0.0442)	−0.0278 (0.0440)	−0.0312 (0.0571)
Interaction effects of meal preparers on log (value of time):				
Non-market-oriented	−0.0786 (0.0480)	0.2833 (0.0657)	0.1152 (0.0655)	0.1208 (0.0849)
Half-market-oriented	0.0388 (0.0213)	0.0922 (0.0292)	0.0041 (0.0291)	0.0859 (0.0377)
Female	−0.0646 (0.0339)	0.0852 (0.0464)	0.0580 (0.0463)	0.0502 (0.0600)
Log (income)	0.0290 (0.0073)	0.0673 (0.0100)	0.0593 (0.0100)	0.0806 (0.0130)
Log (household size)	0.7380 (0.0227)	0.6667 (0.0310)	0.8595 (0.0309)	0.8147 (0.0401)
Region:				
Northeast	0.0466 (0.0170)	0.2217 (0.0232)	0.1996 (0.0231)	0.0975 (0.3000)
North central	−0.0516 (0.0172)	−0.0239 (0.0235)	0.1170 (0.0234)	0.0558 (0.0304)
South	−0.0109 (0.0165)	−0.0836 (0.0226)	−0.1066 (0.0226)	0.0057 (0.0292)
Season:				
Spring	−0.0369 (0.0152)	−0.0783 (0.0208)	−0.0790 (0.0207)	−0.0007 (0.0269)
Summer	0.0561 (0.0151)	−0.1161 (0.0207)	−0.0385 (0.0207)	0.0286 (0.0268)
Fall	−0.0051 (0.0144)	−0.0405 (0.0197)	−0.0694 (0.0197)	−0.0282 (0.0255)

TABLE 1 (continued)

Independent Variable	Nonconvenience Food	Basic Convenience Food	Complex Convenience Food	Manufactured Convenience Food
Race:				
White	-0.2223 (0.0312)	0.0181 (0.0426)	0.1175 (0.0425)	0.1286 (0.0551)
Black	-0.1180 (0.0343)	-0.1157 (0.0469)	-0.0668 (0.0467)	-0.0098 (0.0606)
Urbanization:				
Central city	0.0615 (0.0141)	0.1118 (0.0193)	0.0936 (0.0193)	0.0409 (0.0250)
Suburban	0.0077 (0.0133)	0.0556 (0.0182)	0.0871 (0.0181)	0.0588 (0.0235)
Occupation:				
Farmer	0.1589 (0.0407)	-0.0781 (0.0557)	-0.1255 (0.0555)	-0.0911 (0.0720)
Age-sex variables: Males:				
21 to 54	0.1262 (0.0185)	0.0256 (0.0253)	0.1103 (0.0252)	0.0438 (0.0327)
55 to 74	0.1788 (0.0198)	-0.0094 (0.0270	0.0061 (0.0269)	-0.0734 (0.0349)
75 to 99	0.0412 (0.0314)	-0.1670 (0.0430)	-0.1539 (0.0428)	-0.1655 (0.0555)
Females:				
21 to 54	0.0436 (0.0241)	0.0620 (0.0330)	-0.1087 (0.0329)	-0.0887 (0.0426)
55 to 74	0.0697 (0.0235)	0.0292 (0.0321)	-0.1988 (0.0320)	-0.1950 (0.0415)
75 to 99	-0.0290 (0.0288)	-0.0293 (0.0394)	-0.2296 (0.0392)	-0.2731 (0.0509)
Children:				
0 to 2	-0.1384 (0.0220)	-0.0465 (0.0301)	-0.0608 (0.0300)	-0.0942 (0.0389)
3 to 5	-0.1165 (0.0191)	-0.0737 (0.0260)	-0.0807 (0.0260)	-0.0920 (0.0337)
6 to 11	-0.0756 (0.0169)	-0.0349 (0.0231)	-0.0270 (0.0230)	0.0447 (0.0298)
12 to 18	0.0418 (0.0182)	0.0156 (0.0249)	0.0456 (0.0249)	0.0513 (0.0322)
MSE[b]	0.252	0.472	0.469	0.789
F RATIO	262.40	134.83	236.44	130.45
R-SQUARE	0.469	0.312	0.443	0.305

[a]Standard errors are in parentheses.

[b]Mean Square Error

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TABLE 2. Value of time elasticities for meal preparers with different attributes from models of household expenditure on nonconvenience and basic, complex and manufactured convenience classes of food.

	Non-convenience		Basic convenience		Complex convenience		Manufactured convenience	
Attribute	Male	Female	Male	Female	Male	Female	Male	Female
Market-oriented	.091	.026	-.100	-.015	-.028	.030	-.031	.019
Nonmarket-oriented	.012	-.053	.183	.269	.087	.145	.090	.140
Half-Market-oriented	.052	.065	-.008	.077	-.024	.034	.055	.105

luxury goods, and that demand models that ignore the effects of the value of time overestimate the elasticity of expenditure with respect to income. As income rises, demand for all food should rise, with convenience food demand rising faster than nonconvenience food demand.

The household size elasticities are also very plausible, indicating stronger economies of size for meal preparation using the less convenient foods. It has been verified for all models that the elasticity of household size falls in the expected range, as indicated by the significance of the tests on the upper and lower range of the coefficients. The coefficients of the logarithm of household size range from 0.67 for basic convenience foods to 0.86 for complex convenience foods. The trend for declining household size pointed out by Stafford and Wills [10] implies that households will spend an increasing amount per person on all food. Since the household size elasticity is smallest for basic convenience food and largest for complex convenience food it is hard to predict the overall effect of this trend on share of food dollar spent on all convenience food.

OTHER EFFECTS

The profile of households that are heavy users of convenience foods is directly related to the parameter estimates in the four models presented in this research. White households spend more on convenience foods and less on nonconvenience foods than do black households. For the nonmetropolitan households the value of food used in all categories was the least. For central city households the value of food used in all categories was the largest with the exception of value of manufactured convenience food which was largest for suburban households. Farm households used less convenience foods and more nonconvenience foods than nonfarm households. Money value of all food categories was largest for households in the northeast.

The patterns observed with regard to small children are predictable: the effects are all negative but

most negative for nonconvenience foods. Although the presence of small children reduced the amount spent on all food classes, the effect requires some special interpretation. Since household size is a variable in the model, the parameters of the age-sex characteristics are interpreted as the effects holding household size constant. Therefore, these are not the effects of adding a member of a given category, they are the differences between two households, holding household size (and every other variable) constant, but one household with a member of a given category, the other without one. While the presence of small children in a household indicates less spent than the typical household of a given size, the addition of a small child would increase the amount spent on food with the greatest increase for basic convenience food, and the smallest increase for nonconvenience food.

The presence of teenagers or men aged 21 to 54 in a household indicates more spent on all food than the typical household of a given size. The addition of a teenager would increase the amount spent on nonconvenience and complex convenience food about equally. Presence of females and elderly males cause more to be spent on nonconvenience foods. The significance of the age-sex variables in explaining the dependent variables implies that household size alone is not an adequate measure of food requirements.

SUMMARY AND SUGGESTIONS FOR FURTHER RESEARCH

The intercept shifts for meal preparers show that female meal preparers use more nonconvenience foods, and less convenience foods than male meal preparers. They also show that nonmarket-oriented meal preparers use more nonconvenience foods, and less convenience foods than market-oriented meal preparers. As more women enter the work force and more men become meal preparers, the market demand for convenience foods should increase.

The significance of statistical tests on the range of income elasticities verifies that the food cate-

gories investigated are neither inferior nor luxury goods, and that demand models that ignore the effects of the value of time overestimate the elasticity of expenditure with respect to income. As income rises, demand for all food should rise, with convenience food demand rising faster than nonconvenience food demand. The trend for declining household size pointed out by Stafford and Wills [10] implies that households will spend an increasing amount per person on all food. The significance of the age-sex variables in explaining the dependent variables implies that household size alone is not an adequate measure of food requirements.

Several extensions of this research would be beneficial in verifying the models, resolving inconsistencies and making more detailed predictions. Keeping with the broad approach taken in this research, some further research as to nutritional implications of household behavior should be investigated. The nutritional adequacy of the broad food groups may lead to important policy implications. For instance, if one group of foods should be determined to be less nutritious than other food groups, there may be a special need for educational programs targeted for heavy users of that food group.

Some other demand research would be fruitful as well. Since this research has shown that the model works well for broad groups, a reasonable next step would be to apply the same approach to more specific commodities, where including analysis of price effects is more appropriate. The model suggested would be to estimate the quantity demanded for more specific food groups as functions of market prices, income, value of time, characteristics of the meal preparer, and age-sex composition of the household. Factors that could improve the explanatory power of the models include knowledge of the household's preferences, kitchen facilities, discretionary time, food and nonfood prices faced, dynamic consumption behavior and away-from-home food consumption. Improved demand models for more specific food groups will allow food processors and distributors to anticipate trends in retail markets, improve planning and provide better service to retail consumers.

To take the model to the limit of its capabilities, i.e. to to draw implications about household allocation of members' labor time, would require an enormous amount of data. The model specification would take the form of a complete system of demand and production equations. Estimation of such a system is a desirable goal and should be earnestly considered. However, the information requirements will probably remain prohibitive until surveys and data sets are collected with the full model requirements specifically in mind.

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UNIVERSAL STANDARD FOR INTEREST RATE DISCLOSURES

Richard L. D. Morse, Kansas State University[1]

ABSTRACT

Absent a basic standard, interest rates quotations cannot be compared reliably. The million+ variations for a given rate impose a costly burden on financial institutions and consumers. A standard is presented to reduce cost and increase accuracy in computing, comparing and verifying interest for credit and savings.

The lawful manner of computing and disclosing the rate and amount of charge for consumer credit is established under Truth in Lending (Pub. L. 90-321, as amended). The same terminology applies to all forms of consumer credit whether it be in the form of a cash loan or sales credit. Commercial and agricultural credit is exempt. Also not covered are loans made by consumer-savers when "lending" savings to financial institutions because such loans are not considered consumer credit. Yet, there is a striking sameness in the arithmetic involved; the major differences are merely in the roles played by borrowers, lenders, savers and creditors. The underlying arithmetic is the time value of money which recognizes the use value of capital and interest as the consideration a borrower pays for its use.

Also, most consumers are neither exclusively borrowers or lenders and are often making both credit and savings trade-off decisions based on interest rates that are not comparable. Why, then, it may be asked: Could not a standard "language" or terminology for rates be devised that would eliminate ambiguity and render the rates reliable?

Purpose. It is the purpose of this paper to provide a universal standard, not only for comparing rates of one savings instrument with another, but for comparing credit and savings options, and also for use in verifying interest computations.

Savings emphasis. The savings aspect of consumer finance will be given greater attention in this paper because the major focus over the past twenty years has been on credit disclosure. The basic guidelines for meaningful disclosure of credit terms were established by the Consumer Advisory Council in 1962 [2], and their enactment in Truth in Lending in 1968 has essentially eliminated the prevalence of oral and written credit misinformation. APR and Finance Charge are well established and widely advertised.

Avoidance of Truth in Lending excesses. Whether such a fundamental achievement can be attained for savings disclosures without incurring the regulatory excesses which have accompanied Truth in Lending cannot be addressed adequately in this paper. However, if previous errors are recognized

and avoided the transition to rational savings disclosures can be effected without regulatory excesses.

This author's review [7] of the first decade of Truth in Lending cited the proclivity of regulators to accommodate the industry's reluctance to part with customary trade practices, such as, "add-on rates", "Rule of 78s", "precomputation" and "unearned interest". Also, the basic legislation was flawed in that it was not tight and specific with respect to basic concepts, necessitating complex regulations. For example, many pages of Regulation Z are devoted to distinctions between the "U.S. Rule" and "Actuarial Method", between uses of the 360 and 365-day base years, and ways to count days. There is a positive aspect of the proposed standard for savings, namely, that since it is equally applicable to savings and credit, its adoption for savings may facilitate acceptance of the same tight standards for credit, advancing the true purposes of Truth in Lending: "...to promote the informed use of consumer credit...". Furthermore, as an educator, I cannot resist mentioning the potential that standardization holds not only for improving the efficiency of educating classroom students, but also for the entire financial community which can rid itself of archaic trade customs and address the "use value of money" in a manner appropriate to the 1980's.

The Problem.

The basic problems are two: First, the incredible number of ways interest is currently figured. Second, the lack of uniformity in terminology commonly used. Even the most elementary form of consumer savings, the passbook account, is innocently complex. Variation in types of accounts have been discovered by surveys of savings institution in New Orleans, Louisville, Wichita, San Francisco and Baltimore [4,10]. These surveys were made cooperatively with the author and investigative reporters of local news media with the exception of the New Orleans study. These studies not only asked institutions to respond to questions, but to apply their method to a standard account activity pattern. This validity check revealed differences between the "lip" and the "computer". A recent two-year study [13] was made by the New York State Banking Department which had authority to examine accounts and determine whether the actual interest paid on accounts conformed exactly to the method reported on the survey form. This study contributed not only additional sources of variations, but also the numbers of institutions using the various procedures. All of these studies present evidence of proliferation of methods giving rise to confusion, not only among customers but also bank personnel. Too often only the institution's computer programmer knows the system used, and unfortunately he/she is not in a position to communicate such details to management or to the public in terms that are ac-

[1]Professor of Family Economics

ceptable to the marketing department and under-
standable by the consumer.

An alternative approach to understanding and quan-
tifying the problem is to identify and delineate
the basic variables involved in the computation of
interest. Once the variables are identified, it
is possible to estimate the number of possible
combinations and to evaluate them. It is then
possible to propose standards which have cost-
saving potential and to reduce disclosures to a
comprehensible number.

Over one-million combinations. In Table 1 are
presented the variations that may be found in the
marketing of savings account. The number of dif-
ferent combinations runs conservatively into mil-
lions. For example, there may be as many as 7
methods of compounding using any of 7 interpreta-
tions of the number of days in a year in conjunc-
tion with 5 day-base systems, and one or more of
the 18 methods of determining which balances are
eligible to earn interest. These may be used in
combinations with 18+ different grace day and over
3 dead day systems, employing one of the 11+
rounding policies and one of the 3 policies re-
garding payment of interest upon closing an ac-
count. [7 x 7 x 5 x 18 x 18 x 3 x 11 x 3 = 7.8
million]. This gives a minimum estimate of the
number of possibilities a consumer must consider
when attempting to verify the amount of interest
paid on a savings account. It is minimum because
not all of the items listed in Table 1 are inclu-
ded in the count.

Such complexity is recognized only by those who
have probed for full explanations. Often the dif-
ferences are dismissed as de minimus and consid-
ered to be a non cost-effective effort. Also, the
complexity is masked by over-simplified disclos-
ures. For example, only the annual rate is given.
It may be accompanied by a seemingly innocuous
statement such as "We pay daily interest" which is
not saying "We pay interest daily". That is, they
pay interest on all the money on deposit, using
the DIDO (day-in to day-out) system, but do not
compound daily. Another simple sounding and at-
tractive statement is "We pay interest on all your
money held in the account for the full quarter",
which is to say no interest is paid on deposits
made during the quarter. Such statements may sound
generous, but can be costly for the consumer.

Much of the evidence of the existence of such
variations are anecdotal, but real. This author,
for example, traced a $131.46 difference in the
pay-out of two seemingly identical Certificates of
Deposit. The financial institutions had used in
their computations 360, 365, and 368-day years as
well as both simple and compound interest. Detec-
tion of such ingenious computations required over
two months of persistent inquiry of the financial
institutions for full interpretation of computer
print-outs. The incredible response from the exe-
cutive of another financial institution suggests
that not only are there millions of different com-
binations of known variables, but many more mis-
interpreted and misunderstood variables. When
asked to explain how interest was calculated, he
wrote the author:

"The interest was figured using a 365/360
day year and a 360 day base. This method
assumes that every month has the same
number of days. We use a 365/360 day
year for 6 month MMC's, but with a 365
day base. I know these multiple calcul-
ation methods are confusing, however,
you probably understand them better than
I do."

The potential for errors is well documented by
Granovsky [3] who was unable to verify 85% of 156
passbook savings accounts.

UNIVERSAL STANDARD

The standard disclosure format is based on several
criteria: (1) A rate format which is in current
use and into which other rates can be converted
for making equivalency judgments of savings/credit
options, (2) A rate which can be used directly to
validate performance, that is, to recompute inter-
est amounts, (3) A rate which can be expressed
meaningfully for those who are not sophisticated
in finance, and (4) A basic rate format which is
consistent with the Periodic Percentage Rate and
Annual Percentage Rate terminology of Truth in
Lending.

The rate proposed is one which is widely used by
savings institutions. It is variously described,
but most briefly as "daily compounding on day-in
to day-out balances". This is to say: Interest
is paid each day by multiplying the simple daily
rate by the day's ending balance (which includes
the day's beginning balance plus any deposits and
credits, less any withdrawals and charges made
that day). The interest paid that day is credited
the first of the next day and added to the balance
on which interest is paid the next day.

MDRe   Cents per $100 per day[2]

The basic rate expression is cents per $100 per
day. These values, referred to hereafter as MDRe,
were first used in the published Morse Daily Rate
Tables [6] and its popularized version, Check Your
Interest [8]. The rationale for the cents per
$100 format is that persons can relate more
readily and realistically to cents and $100 units
than they can to percentages and their decimal
equivalents. The contention is that consumers are
more likely to interpret correctly 3.699¢ per $100
than they would 0.03699% or 0.0003699. Further-
more, it is contended that if $200 were the amount,
persons more readily could compute the correct
interest, recognizing it to be twice 3.699¢
(or 7.4¢) than by first decimalizing the percen-
tage to .0003699, multiplying by $200 and then
interpreting the answer of .074 to be 7.4¢. Fur-
thermore, the expression of cents per $100 is
applicable to any currency using the decimal sys-
tem, so this basic rate expression has interna-
tional applicability.

The rationale of the day as the basic unit is that

---

[2]MDRe means Morse Daily Rate equivalent.

Table 1. Variables currently used in computing interest on savings and proposed by USIRD, the Universal Standard Interest Rate Disclosure

	Variable	Variations	No.	USIRD
A.	Time period length			
	Year	360,362,364,365,366,368 or 365 1/4 days	7	365
	Semi-annual	180,181,182,183,184 or 182 1/2 days	6	
	Quarter	90, 91, 92, or 90 1/4 days	4	
	Month	28,29,30,31 or 30.41667 days	5	
	Week	7 days	1	
	Day	Calendar day, business day	2	
B.	Year Base	360/360 365/365 365/360 366/365 366/366	5	365/365
C.	Compound period	Simple, annual, semi-annual, quarterly, monthly, daily, continuously	7	Daily
D.	Balance(s) on which interest is figured	Low balance of month or quarter; Ludlow; DIDO; FIFO (with beginning bal. included or excluded); LIFO; Average Daily Balance for month or quarter; all on balances at beginning or end of period.	9+ 2	DIDO
E.	Grace Days	Number of actual/business days at beginning/end of mo./quarter/semester	18+	0
F.	Dead days	Number of actual/business days at end of period	3+	0
G.	Amounts included	Actual amounts or whole $1, $5, $10, $25 units of deposits and/or of opening balance	5+	Actual amount
H.	Rounding policy for: interest credited interest factor	Up/down/truncate Various	3 11+	Model* Act[9]
I.	Minimums for: bal. to earn interest bal. to avoid penalties amt. of interest to be credited	[See New York study for examples] " "	9+ 7+ 3+	0
J.	Miscellaneous rules regarding account closure, transfer of funds and other procedures not itemized.		+	

*See Comment to Sec. 5(c) of A Model State Act - Consumer Savings Disclosure Act (Truth in Savings Act).

a day's length of time is unambiguous; it is a 24-hour segment of time with exceptions of 23 or 25-hour daylight savings transitional days. Unless otherwise stated, it begins and ends at midnight. However, it can begin at any other arbitrarily designated point in time such as 10 AM or 2 PM Greenwich or Eastern Standard Time, or other times conforming to local customs. Also, because a 24-hour day is internationally recognized, the total expression of cents per $100 per day (per centum per diem) has international applicability. In light of the recent expansion of international financial trading involving the general public, the international aspect of this question of standardization of terminology takes on added significance.

Cents per $100 per day meets the two requirements: (1) for making accurate and reliable comparisons between savings and credit options, and (2) for computing and verifying interest payments. Rate tables are readily available [6,8]. The New York State Banking Department requires every bank under its jurisdiction to make such tables available for customer use in verifying accounts [12]. Also inexpensive hand calculators costing less than $40 are available in lieu of tables. Preliminary findings of an Interest Rate Perception Test sustains the hypothesis that consumers can make comparisons and computations with greater accuracy and confidence if those rates are expressed as cents per $100 per day rather than in conventional rate terms.

Annualized Rates

Traditions and custom favor continued use of <u>annual</u> rate espressions of which there are two: The nominal rate, and, the yield rate. Unfortunately, these are not well defined and are used somewhat indiscriminately without consistent regularity. These limitations in the use of annual rates are well documented. But to illustrate the problems inherent in the word "annual", one may recall that every four years questions arise about how to treat leap year. Why, it may be asked, should the same quoted rate result in a higher daily rate in one year than another? And because one-half of the year is longer than the other, why should a U.S. Treasury bond accrue more interest in one half year than it does the other half? Or, why should different bond issues at the same annual rate accrue different daily interest by the change of the calendar date on which they were issued? Such relatively small details may be so well understood and assimilated by the professionals that they may present no problem for them. Indeed they may be an integral art of the financial world. But as these rates become used and quoted in the popular market as bases for other rates, and as more persons are considering a wider scope of investment opportunities, the potential for deception increases. In summary, annual rates currently cannot be used with the requisite degree of assurance that accurate interpretations are being made. The proposed standard establishes precise meanings.

It is possible to annualize the daily rate in a manner which is meaningful and reliable. The two terms proposed are: Annual Percentage Rate (as in Truth in Lending), and Annual Percentage Yield.

Annual Percentage Rate (APR). <u>The Annual Percentage</u> is a nominal (in name only) and not a functional rate. As under Truth in Lending, the periodic (not annual) percentage rate is applied at the end of each period to compute the interest for the period. For example, it is the monthly 1 1/2% rate that is applied monthly, and not the nominal 18% APR. Following the general guideline of Truth in Lending, the proposed APRe is the periodic rate times the number of periods in a year. In this case, "annual" is made synonymous with 365, so the nominal annual rate is 365 times the daily rate. It may be helpful to express these concepts in formula format:

i = simple daily rate in decimal form (1)

$MDRe = i \times 10,000$ = cents per $100 per day (2)

$APRe = 100 \times i \times 365$ (3)

The suffix "e" designates the values to be "equivalent" values, regardless of any other disclosure term or computation method used. It distinguishes terms from other usages of APR and APY. Also this standard disclosure may be used along with other disclosures thereby supplementing without replacing existing disclosures.

Annual Percentage Yield (APY). The yield concept is used to reflect the effects of compounding. The <u>Annual Percentage Yield</u> expresses in percentage rate form the hypothetical yield at the end of 365 days. Since the daily interest is paid or payable each day, it compounds daily. This hypothetical figure is:

$$APYe = [(1 + i)^{365} - 1] \; 100 \qquad (4)$$

Daily vs. Annual Rate Disclosure. Because the daily rate is not customarily quoted, it may be argued that its disclosure would result in confusion and frustration; that use of the annualized form would be more readily assimilated and accepted. On the other hand, the familiarity argument can become treacherous unless the new annualized terms are clearly distinguished from commonly used expressions. Two examples of annualized usage are offered to illustrate the comparative advantages of daily rates:

Customer literature from the Fidelity Group and from E. F. Hutton discuss their investments; both quote yield values that are almost the same. Hutton's Zero Coupon Bond is purchased Feb. 1, 1982 at $380 and matures Dec. 1, 1988 at $1,000. Fidelity illustrates the computation of an annualized yield of a $10,000 money market investment which, with 4 days accrual of earnings, is worth $10,016.10. The money market fund pays $16.10 on $10,000 after 4 days; the zero bond pays $3,100.00 on $1,900.00 after 2495 days. Which pays the higher yield? The sponsors quote yields of 14.69¢ and 14.68¢, practically a toss-up. However, the <u>cents per $100 per day</u>, computed by using formula (5), are significantly different: 4.02¢ and 3.88¢. This is a difference of $61.10 a year on $10,000. The difference in these two apparently similar instruments is revealed when compared on the same standard.

$$MDRe = 10,000 \left[\sqrt[\text{days in period}]{\frac{\text{closing balance of period}}{\text{opening balance of period}}} - 1 \right] \qquad (5)$$

Annualization merely magnifies the difference by 365 (14.68¢ vs. 14.16¢ APRe) or magnifies and compounds the difference shown clearly by the daily figures 15.81¢ vs. 15.20¢ APYe. Annualization does not increase the accuracy of the facts needed to make the comparative judgment. The same conclusions can be arrived at from daily rates. Another observation is that what both of these reputable organizations refer to as "yield" is out of phase with the defined nominal simple (APRe) or hypothetical (APYe) rates of the standard. The similarity of their "yield" quotes underscores the potential for frustration and deception of persons who rely on unstandardized terms for making comparative judgments.

The usefulness of the <u>cents per $100 per day</u> can also be demonstrated by comparing the position of differently compounded and computed investments quoted at 8%. To perform this exercise, one needs

to go through the mental exercise of comparing 8% compounded semi-annually, quarterly, monthly and daily using a 365/365 and 365/360 bases shown on the right side of the table below, and then to compare these seven in terms of the cents per $100 per day rate which, compounded daily, would produce the same yield. The table below shows those equivalencies [13]:

cents/$100/day proposed:			is the equivalent of the conventional:	
MDRe	daily compounded	8%	com- pounded	day base
2.14¢	"	8%	semi-	365
2.17¢	"	8%	quarterly	365
2.18¢	"	8%	monthly	365
2.19¢	"	8%	daily	365
2.20¢	"	8%	quarterly	360
2.21¢	"	8%	monthly	360
2.22¢	"	8%	daily	360

It should be obvious that less thought and time is required to rank order these alternatives by using the MDRe than by the descriptions of the compounding methods. In fact, such complete information may not be available. They may have been quoted "8% annual rate" if at all. Regulation Q does not require its disclosure unless the yield is disclosed, in which case the yield must be for no more than a year's period, and not appear in greater prominence. It may be correctly argued that the effects of compounding and rate base would have been accurately reflected in the annual yields. So had the APYe values been quoted, the consumer could arrive as readily and quickly at the same decision as if given the MDRe. However, previous research of rate quotations in advertisements [5] and savings literature [1] suggests that yield rate would   have been disclosed for only the higher paying instruments. Lower yields are seldom, if ever, advertised or quoted.

INFORMATION NEEDS

Standards for disclosure must conform to the consumers' needs for information for making financial decisions. The type of information needed varies somewhat with the consumers' situation, and may be classified as:

a' priori: The consumer needs information to consider alternative opportunities before making contractual arrangements.

Trade-offs: After the contract is made, the consumer may wish to evaluate alternative options as they arise and to estimate trade-off casts and benefits.

Evaluative: The consumer may wish to review past performance of a contract and to make comparisons with yields and costs of alternatives.

Validation: The consumer may wish to run checks on interest, principal payments and credits to determine whether they are in accordance with contract terms.

Central to these situations are rates. But is rate information enough? These and other questions regarding adequacy of rate information will be addressed in this concluding section: (1) Is rate information sufficient? (2) If all the consumer wants to know is how many dollars are involved, how important is rate information and might it be misleading? (3) Can the same rate system be applied to past as well as to future performance, and how might they be distinguished? (4) Can the same rate structure be made applicable to both credit and savings situations? (5) Although a single simple rate can work for fixed contracts with regular payments, can it be used with contracts involving payments that are irregular in amount and time?

Sufficiency of rate information. More than rate information is required to make financial decisions. Penalties, bonuses, discounts, points, gifts, premiums, finders fees, restrictions on accessibility and liquidity, methods of compounding and distributing interest as well as many other factors may be even more important than rates. The exclusive focus on this paper, however, is on perfecting the quality of rate information.

Rates vs. dollars. Rate information is no substitute for information about the dollar amounts and time involved; likewise, knowledge of absolute amounts is no substitute for rates. Both sets of information are valuable if properly interpreted and used. Obviously one would prefer to earn $3,100 over $16.10. But only in rate terms, as has been discussed, does the lesser amount appear preferable. The two concepts are often confused, especially when the rates are larger than the amounts involved. For example, in the context of another situation, the maximum speed for a car traveling through a school zone is expressed in miles per hour even though the car will not travel the full 20 miles nor spend an hour in the five-city block school zone. Just as the rate of speed reveals nothing about distance traveled nor time consumed, rates of interest tell nothing about the amount of earnings or finance charges, or about the actual time and money involved. Rates are useful for making comparisons as well as for computing amounts.

Past and future perspectives. Some financial contracts can report rates that are applicable to future commitments; others can only report rates for past performance. For example, money market funds and credit unions, unlike banks, cannot state in advance what rate they will pay. Rates pertaining to the future can be distinguished by adding the descriptor ex ante and those pertaining to past performance by adding ex post.. Variable rate contracts present difficult disclosure problems that are not peculiar to the Universal Standard. However, it is proposed that for contracts which accrue or amortize at other than a constant rate, that both ex ante and ex post rates be posted for various critical points in the life of the contract.

Applicability to irregularities. A related matter is how the Universal Standard can be adapted to financing which involves irregularities of payment times and amounts. This problem has attracted considerable attention under Truth in Lending and has been addressed in Appendix J of Regulation Z and the Comptroller of the Currency's Handbook for Consumer Examinations as well as the Interagency Truth in Lending Procedures manual. Utilizing this effort, the Universal Standard's cents per $100 per day can be computed using formula (6) by inputting the APR derived by the Interagency procedures and the number of days in the unit period.

$$MDRe = 10,000 \left[\sqrt[\text{days in period}]{1 + \dfrac{APR/\text{periods in 365-day year}}{100}} - 1 \right] \quad (6)$$

Credit and savings rates. The final question is whether the Universal Standard rates can be used in making valid comparisons between savings and credit. The answer becomes absurdly clear if the question were phrased: "If you are being paid at the daily rate of 3.28¢ per $100 on your savings account and wish to borrow money at a cost of 3.39¢ or 3.27¢ per $100, would you be better off to use your own savings?" The answer is that you would withdraw savings for the former, but not for the latter. Annual rates for savings and credit are not directly comparable. If you had money invested at 12% compounded daily, you would be better off borrowing 12% making monthly payments; the two 12%'s are not equal trade-offs. As shown in the table below the cost would be 3.272¢, but the loss on savings 3.288¢. The table summarizes the Universal Standard rates for a 12% APR loan with various repayment periods. The values are computed by using formula (6) for the MDRe, formula (3) for APRe, and formula (4) for the APYe values.

Payment period	Days in period	MDRe ¢/ $100/day	APRe %	APYe %
Day	365/365	3.28767	12.000	12.747
Month	365/12	3.27188	11.942	12.683
Quarter	365/4	3.23985	11.825	12.551
Semi	365/2	3.19333	11.656	12.360
Annual	365/1	3.10538	11.335	12.000

The 12% APRe value may be a good starting point for interpeting the above table. A 12% loan, if compounded daily, would produce 12.747% at the end of a year for the creditor. The 12% APYe value reflects the $12 yield of 12% compounded annually. The creditor would be better off collecting interest throughout the year rather than wait 365 days. What may seem strange is the APRe value of 11.942% for a 1% per month (12% APR) loan. Yet, this lower rate reflects correctly the conclusion reached above; it is better to receive daily and pay monthly.

If the annualized terms are confusing, the daily MDRe terms are not! They are the common denom-inator of all of the rate expressions. They reflect the simple daily interest rate i which compounded daily will generate the dollar flows. This simple rate expression not only serves for making accurate comparisons, but also for reproducing the computations. The operations can be performed by anyone who can multiply, divide, add and subtract. Tables and calculators simplify the task, but are not necessary. Thus, it is the i term which is the nucleus of the Universal Standard. It is expressed in cents per $100 per day to give it greater acceptability and be more readily understood and useful.

SUMMARY

The consumer needs rate information that is expressed in an understandable and useable manner for comparing savings and credit options and for validating performance of financial contracts. A major problem is that there may be over a million different combinations of types of savings accounts quoting the same rate for the consumer to compare. The simple daily rate was selected as the lowest common denominator to serve as the basic standard. This expression has the potential of international acceptance since per centum is compatible with any decimal system, and per diem is a universal experience. To render the terms more understandable and useful by the common person, the rate is expressed in cents per $100 per day and labeled MDRe. The values were first published in the Morse Daily Rate Tables. The "e" suffix was added to enable disclosing standard rates for financial contracts that do not pay simple interest on daily balances. Descriptors ex ante and ex post may be added to distinguish time perspectives. Accommodations for irregularities in payments are provided. The daily rate can be used to verify account performance. It meets the criteria of comparability, understandability and usability, and meets the needs of consumers for information prior to contracting, for making trade-off comparative judgments, and for evaluating and validating past performance.

The terminology introduced, although new and different, is technically clean and precise. These are attributes that may insure endurance of this universal standard. The first hurdle is to overcome resistance to change.

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MISLEADING CONSUMERS WITH THE GRAPHICAL NUTRIENT DENSITY FOOD LABEL

Joel Rudd, University of New Hampshire[1]
Nancy Finch Turner, University of New Hampshire[2]

ABSTRACT

This paper reports the results of a study demonstrating that the graphical nutrient density food label has the potential to mislead consumers regarding the nutrient content and quality of food products. Consumer food quality estimations were higher as the calorie base used on graphical nutrient density labels increased. Further, consumer perceptions of food product nutrient levels were positively biased by the addition to the graphical nutrient density label of a calorie base identification statement. Implications of these findings for consumers, policy makers, nutritionists, and the food industry are discussed.

Nutrition labels have been required by the Food and Drug Administration (FDA) on many packaged foods since 1973. The goal of this requirement was to give consumers a fair chance to consider the nutrient content of foods and plan a balanced and healthful diet. The current nutrition label format provides number of calories per serving, total grams of protein, fat, and carbohydrates, and the percentage of U.S. Recommended Daily Allowance (U.S. RDA) for each of eight nutrients.

Since the introduction of the current label, researchers have been concerned because many consumers appear to be confused by the nutrition terminology, the numerical format, and the meaning of the U.S. RDA percentages [1, 2, 8, 17]. Such confusion is thought to hinder product choice and conscientious diet planning. Since 1978, the FDA has been working to develop and test various alternative nutrition label formats, hoping to find one which consumers will find more useful and comprehensive than the current format [10].

The graphical nutrient density format [7, 12] is being given strong consideration as a successor to the current label format [3, 4, 16]. The advantage of the graphical nutrient density format is that it theoretically allows consumers to compare how much nutritional value, in terms of percentage of U.S. RDA, they will receive from a food relative to the amount of calories (in terms of some estimate of daily needs) a serving of that food contains (see Figure 1). A vertical line passing through the endpoint of the calorie bar is intended to encourage this comparison and further, to encourage consumers to select foods in which the nutrient bars pass to the right of the vertical line (i.e., foods for which the nutrient to calorie ratio is greater than 1:1). While the concept of nutrient density has been generally well received by nutritionists [5], its use on food labels poses problems for consumers which have thus far been overlooked. (An exception is Hammonds [6], who briefly discusses potential problems associated with graphical nutrient density food labels.) The present paper outlines several problems with graphical nutrient density food labels and presents some results of an exploratory research study designed to measure the potential of these problems for misleading consumers.
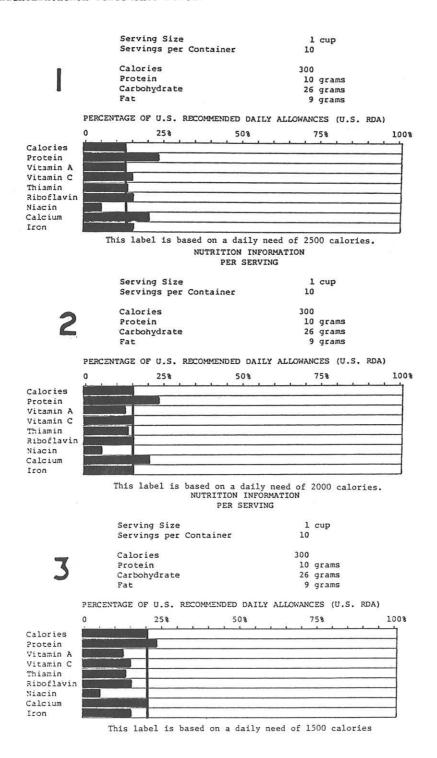
DEVELOPMENT OF HYPOTHESES

In the only empirical study of the graphical nutrient density format, Mohr, Wyse, and Hansen [12] tested its effectiveness against the current label format. Their results indicated that the graphical nutrient density format helped a sample of supermarket shoppers make both rapid and correct nutrition decisions. This effect was more pronounced among shoppers with less education and lower incomes. Despite this favorable evidence, close investigation of the graphical nutrient density format reveals two important characteristics which caution against its use on food labels: (1) The relationship between the calorie bar and the nutrient bars ("nutrient density") is wholly dependent upon the particular calorie base (total daily calorie needs) used; (2) Identification of the calorie base used has not been made available to consumers on the label (consumers could compute the calorie base by using number of calories per serving and the calorie bar, but this involves a fairly sophisticated understanding of the label information and a complex arithmetic calculation). Mohr, et al. used a 2000 calorie base in their study [12], presumably because they believed this number approximates the average daily calorie needs of Americans. Unfortunately, substantial variations in calorie requirements as a function

Figure 1. Graphical Nutrient Density Format Food Labels with Calorie Base
Identification Statements Added.

1

Serving Size	1 cup
Servings per Container	10
Calories	300
Protein	10 grams
Carbohydrate	26 grams
Fat	9 grams

PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)

```
            0        25%       50%       75%      100%
Calories
Protein
Vitamin A
Vitamin C
Thiamin
Riboflavin
Niacin
Calcium
Iron
```

This label is based on a daily need of 2500 calories.

NUTRITION INFORMATION
PER SERVING

2

Serving Size	1 cup
Servings per Container	10
Calories	300
Protein	10 grams
Carbohydrate	26 grams
Fat	9 grams

PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)

```
            0        25%       50%       75%      100%
Calories
Protein
Vitamin A
Vitamin C
Thiamin
Riboflavin
Niacin
Calcium
Iron
```

This label is based on a daily need of 2000 calories.

NUTRITION INFORMATION
PER SERVING

3

Serving Size	1 cup
Servings per Container	10
Calories	300
Protein	10 grams
Carbohydrate	26 grams
Fat	9 grams

PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)

```
            0        25%       50%       75%      100%
Calories
Protein
Vitamin A
Vitamin C
Thiamin
Riboflavin
Niacin
Calcium
Iron
```

This label is based on a daily need of 1500 calories

of sex, age, activity level, health status, and a number of other factors has prevented the FDA from setting a U.S. RDA for calories [13]. Thus the "% of daily nutrient needs" statement on a graphical nutrient density label is appropriate for the nutrients listed, but is incorrect when applied to calories.

Whatever calorie base is used, it seems likely that consumers, most of whom do not have a clear idea of their own calorie needs or that of others [13], would be influenced by that base. For instance, it seems likely that the calorie base used affects consumer estimates of the nutritional quality of the labeled food. More specifically, the higher the calorie base used, the better the likely estimated quality of the food. Figure 1 shows three graphical nutrient density labels for a single food product; only the calorie base differs across the three labels. Note that as the calorie base increases, more nutrient bars equal or exceed the calorie bar (i.e., the food product appears to be more "nutrient dense"). Graphical nutrient density food labels could thus mislead consumers concerned about the actual nutrient content of food products. Should the graphical nutrient density format begin to be used on food labels, manipulation of calorie bases becomes a real possibility, with the food industry pushing for the highest possible calorie bases (e.g., 2500), and nutritionists prefering lower bases (e.g., 2000). (Use of multiple calorie base food labels is precluded by lack of available space.)

Nutritionally identical food products may appear to have relatively more or less nutrient content depending upon the calorie base used on nutrient density food labels, with higher calorie base labeled foods appearing to be more nutrient dense than lower calorie base labeled foods. Thus, Hypothesis 1 predicts a positive relation between calorie base level and consumer food quality estimations: the higher the calorie base level, the higher the quality estimation.

As noted above, the graphical nutrient density format tested by Mohr, et al. [12] did not directly identify the calorie base used. This lack of an identifying statement makes it very difficult for consumers to discern what calorie base is being used on the label they are viewing. Providing a calorie base identification statement on the label (e.g., "This label is based on a daily need of 2000 calories.") is likely to increase consumer confidence in and satisfaction with the nutrient density format. This increased confidence and satisfaction may be reflected in consumer perceptions that food products labeled with a calorie base identification statement are more nutritious than (nutritionally identical) food products labeled with a nutrient density format label without calorie base identification. This type of "halo effect" has been found in prior food label surveys: even when understanding and use of increased amounts of label information is lacking, the simple presence of the additional information on the label leads consumers to believe foods so labeled are superior [9, 11, 14]. Thus, Hypothesis 2 predicts that the presence of a calorie base identification statement on a label will positively bias consumer perceptions of the nutrient levels in the food product.

QUESTIONNAIRE DESIGN AND ADMINISTRATION

Booklets containing a series of stimulus food labels and questions appropriate for testing Hypotheses 1 and 2 were designed and pretested.

Part 1 of each booklet contained a stimulus food label in the graphical nutrient density format using either a 1500, 2000, or 2500 calorie base (see Figure 1). The variable of interest in Hypothesis 2, calorie base identification, was manipulated by including the statement "This label is based on a daily need of 1500 (2000, 2500) calories" on half of the stimulus labels. The other half of the stimulus labels contained no identification statement.

The order in which the nutrient names appeared on the stimulus labels was constant (the order mandated by current FDA regulations was used). Two different randomly derived orders of nutrient bars were used to avoid the possibility of a nutrient name/nutrient bar confound. The particular calorie base and order of nutrient bars presented to respondents were randomly determined. The instructions in the booklet asked respondents to examine the stimulus food label and to answer a number of questions which tapped their perceptions of (1) the degree to which each of the eight stimulus nutrients was present in a satisfactory amount; (2) the degree to which the eight stimulus nutrients as a group were present in a satisfactory amount; and (3) the likelihood that they would purchase that food product based on its nutrient content. Specifically, respondents were asked, for each of eight nutrients, "How satisfactory a source of (nutrient name) is this food product?". In addition, respondents were asked "Overall, how satisfactory a source of the eight nutrients listed in this food product?". These nine questions utilized nine-point response scales ranging from "very unsatisfactory" to "very satisfactory". Finally, respondents in Part 1 were asked "How likely are you to purchase this product because of its nutrient content?" (nine-point scale: "very unlikely" to "very likely").

Part 2 of the booklet contained three stimulus food labels in the graphical nutrient density format: one each using a 1500, 2000, and 2500 calorie base (see Figure 1). Except for the length of the calorie bar and its associated vertical line, the three food labels contained identical nutrient information. In effect, the stimuli in Part 2 consisted of three label variants for one food product, presented to respondents as information on three food products. The order in which the three labels were presented on the page was randomly varied and, as in the Part 1 stimulus label, two different randomly derived orders of nutrient bars were used. Respondents were asked to carefully examine the three labels and then to rank order the three food products they represented from most to least satisfactory.

The 88 respondents in the study were solicited from among grocery shoppers in three supermarkets belonging to a large chain. The three stores were chosen specifically because their patrons covered a wide range of socio-economic, age, and other demographic characteristics. The study was conducted during morning, afternoon, and evening hours, and on both weekdays and weekends. Shoppers were asked by interviewers to volunteer to participate in a "Nutrition Labeling Study" being conducted by researchers from a nearby university. The study was briefly explained and verbal instructions were given by the interviewer to supplement the written instructions in the booklet. Respondents completed the two parts of the study separately; Part 1 always preceded Part 2.

RESULTS

Table 1 presents respondents' food quality estimations from Part 2 across calorie base conditions. As predicted by Hypothesis 1, the mean rank order of estimations declines monotonically from calorie base 2500 to 1500. Analysis via Friedman Two-Way ANOVA by Ranks [15] indicated a significant calorie base effect on rank order estimation (X_r^2 = 39.09, df = 2, p <.001).

TABLE 1

Consumer Food Quality Estimations Across Calorie Base Conditions

Calorie Base Condition	Mean Rank[a]
2500	1.52
2000	2.00
1500	2.48

Where 1 = most favorable estimation
3 = lease favorable estimation
[a]Mean Ranks significantly different at p <.001 by Friedman Two-Way ANOVA
N = 86

The data used to test Hypothesis 2 were responses to the stimulus food label in Part 1 of the booklet. The three dependent measures were (1) overall satisfaction with nutrient content, (2) summed satisfaction with the content of the eight nutrients (summing the eight responses and dividing by 8), and (3) the likelihood of purchasing the product for its nutrient content. Mean responses on these three variables across calorie base conditions are given in Table 2. For all three measures the means are in the hypothesized direction and all differences are significant by one-tailed t-test (overall: t = 1.84, df = 86, p<.05; summed: t = 1.98, df = 84, p<.05; likelihood: t = 2.17, df = 84, p<.05).

TABLE 2

Mean Consumer Perceptions of Food Product Nutrient Levels by Presence or Absence of Calorie Base Identification Statement

Perceived Nutrient Level Measures	Calorie Base Identification		
	Present	Absent	p<
Overall Satisfaction With Nutrient Content[a]	4.84 (44)	4.11 (44)	.05
Summed Satisfaction With Nutrient Content[b]	3.98 (43)	3.30 (43)	.05
Likelihood of Purchase For Nutrient Content[c]	4.14 (42)	3.23 (44)	.05

[a]Where 1 = very unsatisfactory...9 = very satisfactory
[b]Where 1 = very unsatisfactory...9 = very satisfactory; responses to each of eight nutrient level satisfaction questions summed and divided by 8
[c]Where 1 = very unlikely...9 = very likely
Probabilities based on one-tailed t-tests

DISCUSSION

Both hypotheses in this study were confirmed by the data. First, calorie base level significantly affected consumer estimations of food product quality. Food quality estimates declined as the calorie base used declined, despite the fact that the stimulus food labels portrayed nutritionally identical food products. Second, the presence or absence of a calorie base identification statement on labels affected consumer perceptions of food nutrient levels. Consumers perceived nutritionally identical foods to have higher nutrient levels when a calorie base identification statement was present on a label than when it was absent.

There are several implications of these findings for consumers, policy makers, nutritionists, and the food industry. Most importantly, the findings of this study indicate that the graphical nutrient density label format can be used to mislead consumers regarding the nutrient content and quality of food products.

It is apparent that manipulation of the calorie base used on graphical nutrient density labels is a potentially major problem. It would probably be in the best interests of the food industry to have the highest possible calorie base used. This would make their food products appear more nutrient dense. It is important to note that the highest calorie base level tested in this study (2500) exceeds the daily calorie needs of a large segment of the American population. On the other

hand, if nutritionists succeed in promoting a lower calorie base (e.g., 2000), the food industry might well protest, and there will still be many Americans for whom this calorie base is too high or too low.

It is hoped that this study will alert policy makers to these calorie base level problems in the graphical nutrient density label. There are at least two reasonable responses for policy makers. First, they could avoid the graphical nutrient density label and its associated problems by opting to mandate use of some other label format or formats. Second, they could investigate the graphical nutrient density format more thoroughly in an attempt to mitigate the calorie base problems, perhaps by developing data enabling the advantages of the graphical nutrient density format to be weighed against its disadvantages. If the latter course is chosen, further research on possible additional effects of varying calorie bases would be in order. One direction such research might take would be to study the effects of calorie base on consumers' own estimated daily calorie needs. As has been pointed out, many consumers have little idea of their own daily calorie needs [13]. Reading graphical nutrient density labels stating "% of daily nutrient needs" with calories listed below the statement as one of the "nutrients," may have a measurable impact on consumers' estimations of their own daily calorie needs.

This study also found that merely adding a calorie base identification statement to the graphical nutrient density label had a major impact on consumer perceptions of nutrient levels. The most general implication of this finding (and others similar to it) is that a little added information can have a big, and generally, positive impact on consumer perceptions of the food products they buy. The food industry may wish to take note of this phenomenon and soften some of its opposition to additional information disclosure. Policy makers must be conscious of the type of impact a little information can have as they go about deciding how much information disclosure to require. Again, more research is needed to illuminate this interesting and important informational effect.

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FOOD PRICES AND SELECTED FOOD PROMOTIONS: A DECADE COMPARISON

Mary L. Carsky and Esther McCabe, The University of Connecticut[1]

Abstract

A comparison of supermarket prices over a decade is used to assess the effect of selected promotional devices. Results indicate that while there may be a lowering of costs by purchasing private brands rather than nationally advertised products, the former is not always the best buy. The percent of savings achieveable through the substitution of private brands has decline over the ten years studied. The discontinuance of trading stamps may temporarily reduce prices but the effect can be short lived. Contrary to the usual charges, coupon distribution has not had a negative effect on supermarket prices. The costs of such campaigns appear to have been absorbed into promotional expenses.

INTRODUCTION

Supermarket shopping continues to be a topic of interest and concern among consumers and consumer educators as this essential activity, though consuming a smaller proportion of disposable personal income, still accounts for a large segment of the weekly household budget. As consumers are always seeking methods to decrease the cost of food, the food industry and the supermarkets seem to have devised an unlimited number of promotional devices to attract the attention and dollars of the shopper. While there are relatively few firms in the food processing industry, brand proliferation and product differentiation have led to intense competition in product categories as wholesalers vie for shelf facings at retail. Intense competition among retail outlets has led supermarkets to engage in non price competition through the use of promotional activities.

During the 1960's games and giveaways were used to attract consumer dollars. When it was discovered or at least publicized that these added to the cost of food, and yielded few economic benefits to the consumer, most supermarkets quickly abandoned the practice in a move toward lower prices. By 1970, trading stamps became the "target price inflator" (21). Supermarkets, in an expression of interest in lowering prices, gave up trading stamps. A food price survey conducted in Manchester Connecticut during 1971 demonstrated that the supermarket that had recently discontinued trading stamps did indeed have lower prices than the remaining stores surveyed. When the survey was replicated one year later, the prices at this store were mid point among the ten stores surveyed in the trading area. Two of the surveyed stores were still giving trading stamps at the time of the 1972 survey; the prices at these were no higher than the prices at non stamp stores. Hence, it was concluded that trading stamps did not in fact contribute to higher prices in this trading area; they simply represented an alternate use of promotional dollars by selected supermarkets.

Since 1972 supermarket prices have soared. According to the Bureau of Labor Statistics, prices of food increased by one hundred thrity percent between February 1972 and March 1982 (7). Other accounts of price increases will vary in the magnitude of the change dependent on where the survey was taken and what was included. U.S. News and World Reports recently stated that consumer spending for food had increased from $99.8 billion in 1972 to $250.7 billion in 1982 which represents a one hundred fifty percent increase. In spite of the fact that food at home now consumes and average of approximately twelve percent[2] of disposable income, a decrease from eighteen percent over the past ten years, consumers tend to view the increase in prices as being significantly larger than the proportional decrease in the cost of food in the family budget. They continually seek new methods to decrease the weekly grocery bill. During the past decade they have joined food cooperatives, shopped farmers' markets, and planted gardens (12). These alternatives to the supermarkets have not provided families with the assortment of goods available at the store.

For well over fifty years the store brands or private label brands of food and non food products have been available (5). Traditionally, these have been priced lower than nationally advertised brands. The wise shopper has been urged to purchase these lower priced alternatives. This method of achieving cost savings has long been recommended in consumer education textbooks (1,22).

In recent years the food industry has expanded product offerings in quality/price ranges to include generic products. These food items and paper goods (priced 20-25% below nationally advertised brands) are packaged in "plain wrappers" to further emphasize the "low price, no frills" image of the goods. It is estimated that generics have captured 2.4% to 8.4% of the supermarket dollar, but they have not been assimilated into the ordinary shopping patterns of the average consumer (16,20). In some stores rather than being integrated with like products, the generics have been segregated away from the main flow of traffic.

"Couponing and Refunding" has become a national passion over the past few years. The number of manufacturer coupons distributed mushroomed from ten billion in 1965 to ninety billion in 1980. While only one in twenty coupons have been redeemed and the number now appears to be waning, reports that four out of five families have used coupons seem to indicate that this type of promotional

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[1]Ms. Carsky is a lecturer in Family Economics and Management; Dr. McCabe is an associate professor

[2]Depending on income, food expenditures can range from 5% to 40% of the household budget.

activity has been favorably accepted by the consumer (10). Coupons, while providing savings at the checkout, have been criticized by consumer specialists and several retail chains as being "price inflators" because the costs associated with these are passed on to all in the form of higher prices. They have been referred to as being discriminatory in nature in that low income consumers who do not subscribe to magazines and newspapers are disadvantaged in their ability to achieve savings. Coupons have been blamed as creating an illusory savings as they may only reduce the cost of nationally advertised brands to equal the cost of the private store brand. Additionally they have been attacked for imposing a time cost on the consumer who must search through newspapers and magazines, clip the coupons and organize them in a convenient way so that they will be retrievable at the market (8,22). Coupons have most recently been castigated for not having kept pace with the cost of living. In 1980 the average face value of coupons was 23.5¢ (10).

The purpose of this study is to report a longitudinal study of food prices that casts doubt on a few of the truisms that have been accepted for many years concerning the savings by substituting private label goods and possible expenses incurred with the use of selected promotional devices. Data for this paper have been collected from 1972 to 1982. Surveys were conducted in 1971 and 1972 to determine the level of savings possible by substituting private label goods for name brands and to determine whether or not stores that gave trading stamps charged higher prices. In addition, an assessment of the price dispersion among supermarkets in a limited trading area was made. Surveys were conducted from 1972 to 1982 for the generalized purpose of assessing price level changes among commodity groups, measuring price dispersion inter and intra chain, and to observe other changes in marketing practices in the grocery industry.

The cost to the grocer of the various promotional devices has not been considered here. In this situation trading stamps are generally more expensive than coupons as the grocer pays for the former (21) while the manufacturer absorbs most of the cost of the latter.

METHODOLOGY

To develop the survey list in 1971, ten homemakers in two parent/two or three child households recorded all supermarket purchases for a three week period. This resulted in a shopping list of four hundred and fifty items including grocery, dairy, frozen foods, non-foods, meat, produce and other products. The list specified the brand name and size of each item to be priced as well as comparable store brand items if they were available. Ten frequently shopped supermarkets within a five mile radius of downtown Manchester, Connecticut were surveyed during the last week in January and the first week in February 1971. Of the total list, forty-four items in addition to most meat products were available at all ten stores. Food price comparisons were made on the basis of this

list. The survey was replicated during the same time period in 1972.

In 1979 the original list was expanded to fifty-seven items and it was modified to balance it by including more grocery items, and to account for changing tastes and preferences. Surveys of supermarkets in several areas of Connecticut have been conducted over the ensuing years. The majority of the surveys have been conducted in the northeastern section of the state.

For the purpose of the development of this paper, survey data from 1972, 1980 and 1982 were used. The items common to the 1972-1982 lists were used to compare changes over the ten year period. Data from the five supermarkets surveyed in 1972[3] were compared to data from six supermarkets surveyed in 1982.

To compare the change in the price of nationally advertised brands relative to the price of private label goods, items from the 1972 for which stores carried private label substitutes were selected. These same items were selected from 1980 and 1982 survey lists.

FINDINGS

1971 – 1972

The survey conducted in 1971-1972 indicated that there was little price dispersion within the geographic market demonstrated through the use of this survey list. An item by item analysis illustrated that no supermarket carried the lowest price nor the highest price for all items. Table I illustrates that stores which gave trading stamps did not charge higher prices overall.

TABLE I. Price Comparisons 1971-1972.

	1971	1972	$ Change
Super Finast	$26.50	$27.25	+0.75
Top Notch	26.75	26.26	−0.49
Stop & Shop	26.81	27.52	+0.71
Hartmann*	27.03	28.35	+1.32
Shop Rite	27.18	27.11	−0.07
Crispino's*	27.39	27.31	−0.08
Grand Union*	27.62	28.34	+0.72
Popular**	27.92	28.95	+1.03
Pathmark	-----	26.09	----
A & P*	28.83	29.71	+0.88
MEAN	27.34	27.69	+0.35

* Indicates store gives trading stamps
** Store discontinued trading stamps between the 1971 and 1972 surveys

In the month preceding the 1971 survey, Super Finast stopped giving trading stamps. The elimination of this promotional practice was accompanied by an advertising campaign which focused on the

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[3]Five of the stores surveyed in 1972 were out of business in 1980.

price reductions possible through the discontinuance of trading stamps. As the table illustrates, the store did have the lowest prices for this list in 1971, but by 1972 the prices were in line with those of the remaining stores surveyed. Thus, it appears that the stores which give trading stamps do not necessarily charge higher prices; the cost of trading stamps is apparently absorbed into the pro-motional expenses of the retail outlet. A comparison of the market basket using national brands to a like market basket substituting private store brand in 1972 indicated that the consumer could save up to $5.00 on this $27.00 market basket as shown in Table II. The dollar amount of savings was directly related to the number of private store brand items carried by the supermarket. With the exception of A & P, a larger number of items resulted in greater savings.

TABLE II. Brand Name vs. Private Label (1972)

	Name Brand	Private	$ Saving	% Saving
Super Finast	$27.25	$23.45	$3.80	16.2%
Top Notch	26.26	None	None	None
Stop & Shop	27.52	24.77	2.75	11.1
Hartmann	28.35	26.07	2.28	8.0
Shop Rite	27.11	22.74	4.37	19.2
Crispino	27.31	26.65	0.66	2.5
Grand Union	28.34	23.97	4.37	18.2
Popular	28.95	27.30	1.65	6.0
Pathmark	26.09	23.10	2.99	12.9
A & P	29.71	27.57	2.20	8.0

Findings 1972 - 1982

A comparison of supermarket prices for stores in northeastern Connecticut between February 1972 and 1982 using name brands, as given in Table III, demonstrates a price increase for the decade to be 127.8% which closely parallels the Consumer Price Index increase of 130% for the time period (6).

TABLE III. Price Comparisons: 1972 - 1982

Supermarket	1972	Supermarket	1982
*Shop Rite	$22.02	*Finast	$47.83
*Stop & Shop	23.48	*Stop & Shop	49.52
**Finast	23.48	**Better Value	52.89
**Hartmann	24.46	**A & P[3]	53.89
A & P[1]	25.47	***Waubaum's	57.90
		***A & P[2]	58.48
MEAN	23.78	MEAN	54.18

Table IV provides comparisons of branded and private label items at selected supermarkets during the three specified years. The three supermarkets in the 1972 survey were in the same general trading area as were the three supermarkets listed for 1982. Given this similarity in competitive conditions, there appeared to have been greater price dispersion among national brands in 1972 and greater price dispersion among private label items in 1982.

TABLE IV. Name Brands vs. Private Brands
A Decade Comparison - Selected Supermarkets

	Name Brands	Private Labels	Percent Savings
1972			
A & P	$8.20	$5.95	37.4%
Stop & Shop	$7.37	$5.66	30.2%
Shop Rite	$7.58	$5.88	28.9%
MEAN	$7.70	$5.81	32.4%
1980			
Stop & Shop	$16.72	$13.49	23.9%
Shop Rite (Manchester)	$15.52	$13.26	17.0%
Shop Rite (Willimantic)	$16.44	$13.62	20.7%
MEAN	$16.22	$13.46	20.5%
1982			
Finast	$16.66	$12.72	31.0%
Shop Rite	$16.40	$14.13	16.1%
Stop & Shop	$16.46	$13.58	21.2%
MEAN	$16.51	$13.58	22.5%

This comparison of name brand vs. private store brand items illustrates the percent of savings achievable through the substitution of private brands has declined over the past ten years. The mean price figures presented in Table V show that the savings in 1972 ($7.68 - $5.82) to have been 34%, in 1980 ($15.92 - $13.40) to have been 21%, and in 1982 ($16.50 - $13.50) to be 22%. While the nominal cost of all items on the list increased, the table points to the fact that the nominal savings achievable through the purchase of private label items decreased (1972 - 1982) on six of the fourteen items.

The average face value for coupons in 1980 was reported to be 23.5 cents. (10) According to the data presented, only four of the items from the 1980 price survey had a price difference larger than 23.5 cents between the name brand and private label substitute. Hence, for ten of the items in the survey a coupon with an "average face value" would reduce the cost of the item to below the cost for the private label substitute. Observations of the 1982 data illustrate that for two of these selected items, the price of the national brand was less than the price of the private label substitute.

These results are in agreement with a review of several recent issues of Consumer Reports (11, 13, 14, 17, 18) which indicated that for some products the private label items were cheaper, but in others the national brands were less expensive. In one study (11) the national brand was by far the "best buy".

TABLE V. Name Brands vs. Private Brands: A
Decade Comparison - Selected Items

	1972			1980			1982		
Item	NB	PL	N-P	NB	PL	N-P	NB	PL	N-P
Reynolds Wrap	0.73	0.62	0.11	1.28	1.25	0.03	1.24	1.30	- .06
Scott Towels	0.37	0.28	0.09	0.85	0.70	0.15	0.67	0.67	0.00
Cascade	0.77	0.41	0.36	2.09	1.29	0.88	2.57	1.49	1.08
Chlorox	0.50	0.36	0.14	0.94	0.69	0.25	0.84	0.62	0.22
Fleischman's Margarine	0.51	0.33	0.18	1.13	0.86	0.27	0.95	0.59	0.36
Minute Maid Orange Juice	0.55	0.42	0.13	0.96	0.93	0.03	1.06	1.01	0.05
Wesson Oil	0.66	0.55	0.11	1.33	1.19	0.14	1.16	1.02	0.14
Muellers' Elbow Mac.	0.70	0.49	0.21	0.74	0.63	0.11	0.69	0.52	0.17
Chock Full of Nuts Coffee	0.95	0.71	0.24	2.62	2.20	0.42	2.20	2.12	0.08
Duncan Hines Cake Mix	0.39	0.29	0.10	0.82	0.70	0.12	1.00	0.72	0.18
Skippy Peanut Butter	0.45	0.42	0.03	1.25	1.06	0.19	1.86	1.49	0.37
Heinz Ketchup	0.39	0.34	0.05	0.95	0.77	0.18	1.10	0.84	0.26
Campbell's Chix Soup	0.17	0.15	0.02	0.30	0.28	0.02	0.26	0.29	- .03
Bumble Bee Lt. Chunk Tuna	0.54	0.45	0.09	0.97	0.85	0.12	0.90	0.82	0.08
TOTAL	$7.68	$5.82		$15.92	$13.40		$16.50	$13.50	

NB - Name Brand
PL - Private Label
N-P - Name Brand less Private Label

A comparison of three supermarkets of the same chain located in non competing markets indicated that considerable price dispersion may exist intra chain. The total price of the fifty seven item market basket ranged from $76.85 to $79.30 when nationally advertised brands were priced. There was less price dispersion among the stores when private label items were substituted. The market basket totals ranged from $66.85 to $68.10. The percent savings possible through the substitution ranged from 14.3% to 16.4%. The store with the lowest market basket price for both name brands and private label substitutes was giving double coupon redemption during the survey week as well as most of the year. This store is located within one quarter mile of a warehouse food store. The remaining two stores were not located near a warehouse store.

SUMMARY AND CONCLUSIONS

The findings of the 1972 - 1982 food price surveys in Connecticut indicate that consumer educators may want to include a caveat along with the purchase guideline - that one can save money by buying private brands. While the evidence presented here indicates a savings, the consumer should be advised to check prices. The private label item is not always the best buy. Although it is merely conjecture, it is possible that supermarkets, being aware of the consumers' conditioning to the belief that the private label item is a better buy, have raised the price of these on the assumption that consumers will purchase these without checking the alternative name brand products.

To charges that coupons have increased food prices, the findings of this study indicate the contrary. If coupons increased the prices of national brands on the supermarket shelves, the price spread between name brands and private store brands should have increased in recent years. The data in this study indicate that the price spread between the two types of goods has decreased by 11% from 1972. Further evidence that couponing may not be responsible for higher prices has been demonstrated through the market basket comparison of individual supermarkets in a chain as the store giving double coupons had a lower market basket total than the two stores in the chain that were not giving double coupon redemption. The evidence provided within this paper may lead one to the conclusion that coupon distribution and redemption has not had an inflationary impact on supermarket prices. The costs associated with coupon handling appear to have been absorbed into the promotional expenses of food marketing.

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A REVIEW OF FEDERAL FOOD ASSISTANCE POLICY AND PROGRAMS

Kathryn A. Longen, U.S. Department of Agriculture[1]

ABSTRACT

The food assistance programs in the 1970's were characterized by rapid growth in participation and costs. Federal policy encouraged participation in the programs and the liberalization of program benefits. The 1980's have brought a markedly different approach to food assistance in response to efforts to reduce the Federal budget. This paper provides a review of major legislative changes in the Federal food assistance programs, describes current economic research in the U.S. Department of Agriculture and discusses possible future policy directions and topics for research.

INTRODUCTION

I have been invited here today to discuss the U.S. Department of Agriculture's (USDA) research in the area of food and nutrition policy. This talk is heavily weighted toward the food programs because my own research has been in that area.

Meetings such as this provide an excellent forum for reviewing the effects of past and current policies, as well as for considering new ideas and directions for Federal program operation and design. I would like to concentrate initially on some of the major legislative changes in the Federal food assistance programs and their effect on program participation and costs. With a clear understanding of the focus and intent of Federal policies as reflected in these changes, we can outline current issues for research and discuss studies presently being conducted at USDA. I will also discuss possible future policy directions and topics for research.

THE DETERMINANTS OF PROGRAM OPERATION: A LOOK AT THE 1970's

We can regard the 1970's as the beginning of a true, integrated system of Federal food assistance. Until then, food programs were operated largely as mechanisms for surplus removal, designed primarily to help support farm income. Events of the late 1960's, including publication of Hunger U.S.A. and other books describing the extent of domestic poverty and hunger, began to change that policy perception. Food programs in general began to be regarded as programs of income assistance to improve the diets of poor families and children.

As a result, emphasis shifted from supplementing diets with donated commodities to providing balanced meals in many of the child nutrition programs. The Food Stamp Program (FSP) became the

national approach to general food assistance in 1974, replacing the direct distribution of foods to individuals with purchase vouchers or stamps. National standards for many of the programs replaced State and local regulations, guaranteeing uniform eligibility requirements and benefits.

These and other changes designed to make the programs more responsive to the needs of the low-income population, resulted in dramatic growth in the 1970's in the number of recipients and cost of Federal food assistance. Funding for the programs rose from $1.5 billion in FY 1970 to $10.5 billion in FY 1980.

The FSP exhibited the largest growth in program size, increasing from 4.3 million recipients at a cost of $550 million in FY 1970 to an average of 17.7 million recipients at a cost of $6.5 billion in FY 1980. Federal cash expenditures for the five child feeding programs rose from more than $420 million in 1970 to nearly $2.7 billion in FY 1980. The dominant theme of food assistance in the 1970's was clearly the encouragement of participation in the programs and the liberalization of program benefits.

The important point is that changes in food and nutrition policies, as well as in economic and agricultural conditions in essence, determine program operation. The prevailing political philosophy or attitude, of course, guides determination of Federal policy.

PROGRAM REDUCTION: THE THEME FOR THE EIGHTIES

We are witnessing a markedly different approach to the food assistance programs in the 1980's. The Administration's efforts to reduce Federal expenditures are reflected in an increasing number of legislative changes in program eligibility and benefits. The stated intent is to focus food assistance on those deemed most in need, while reducing Federal outlays. The general result has been, for many of the programs, the first significant decreases in participation and funding levels in over a decade.

The major legislative changes in the food assistance programs since 1980 are summarized briefly below. In addition, the effect of these provisions on participation and program costs are detailed.

The Omnibus Reconciliation Acts of 1981 and 1982 and title XIII of the Agriculture and Food Act of 1981 have significantly changed the scope and operation of the Food Stamp and child nutrition programs. The legislation mandates stricter income eligibility criteria, reduces the frequency of cost-of-living adjustments, lowers the

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subsidies for the child feeding programs, and increases efforts to reduce fraud and abuse.

Provisions affecting the National School Lunch Program (NSLP) have contributed to a decline in average participation from 27.1 million in FY 1980 to 23.1 million in FY 1982. Reduced Federal subsidies have led schools to charge higher prices for lunches, usually up 15 to 25 cents. In addition, the maximum charge for a reduced-price lunch has doubled, increasing from 20 to 40 cents. Higher meal costs, then, have served to reduce program participation.

Other changes contributing to decreased participation in the NSLP include stricter eligibility criteria for free and reduced-price meals and a provision, effective October 1, 1981, which limits participation in the child nutrition programs by private schools to those with an average annual tuition of $1,500 or less per child. USDA estimates that 1,000 public schools and 500 private schools have dropped out of the school lunch program since these program changes became effective.

Stricter eligibility guidelines have also been instituted for the FSP. Other cost-cutting measures instituted for the program include: A temporary reduction in the rate at which benefits are adjusted to reflect changes in food costs; a reduction in administrative expense payments by USDA to States which fail to meet targets for error reductions (underissuances, invalid eligibility decisions, and payment errors); elimination of benefits under $10 during the first month of an applicant's eligibility; a delay in the cost-of-living adjustments in the standard, medical, and child-care deductions from gross monthly income; prorating new food stamp participants' first month of benefits daily based on the date of application for food stamps. This provision means that a household with no net income who applied for food stamps when there was one week remaining in the month received stamps equal only to the weekly value of the allotment for the household's size. Previously, the household received the full month's allotment of food stamps.

The result of these and other provisions is clearly seen in the annual program expenditure data. The Federal cost of the FSP fell from $10.6 billion in FY 1981 to $10.2 billion in FY 1982. Cost savings that would be expected, and desired, from the program changes have been partly offset by cost-of-living adjustments in benefits and increases in participation due to a deteriorating unemployment situation.

TOPICS OF CURRENT USDA RESEARCH

The preceding discussion has covered less than 15 years of food assistance history and yet we are afforded two opposing views of program design and operation. The topics of USDA's food assistance research have changed to reflect the prevailing philosophy.

In early 1981, for example, the Economic Research Service (ERS) of USDA began looking at the issue of block grants and the possible effects of converting to such a system on the food assistance programs. The result was a report, published in November 1981, entitled An Alternative Approach To Food Assistance: Categorical Grants.

Because the report considers the effect of converting only the FSP, it is necessary to draw the distinction between block and categorical grants. A block grant involves the consolidation of several programs or activities, funded as a single broad program. A categorical grant, in contrast, is basically a federally funded, State-administered program dealing with a single activity or category of recipients, and operating under a set of established rules.

Transferring program administration to States through a Federal grant system, in general, has been proposed to reduce program costs. Block grants address concerns of program fragmentation and overlap. Savings may result from the consolidation of programs with compatible purposes and goals, largely due to the elimination of a fragmented system of program administration.

Advocates of Federal grants for State program administration further claim the superior ability of States to identify and satisfy the requirements of the targeted population. This claim implies greater program efficiency at the State level and programs which meet the particular needs of its low-income residents. Greater efficiency in the delivery of benefits to recipients implicitly assures that more funds are available for those designated as most in need.

In addition to fiscal considerations, the use of grants, rather than direct Federal control, may also reflect the desire to return certain functions to the States which are currently conducted at the Federal level. The broader philosophical issue of separation of State and Federal powers is apparent in the Administration's proposals to decentralize the Federal Government by curbing spending and reducing the regulatory burden. The acceptance of this philosophy, however, depends largely on the performance of similar grant programs, as well as the willingness of both Congress and the administering agency to relinquish control of program management.

Opposition to grants centers around the ability of all States to effectively design and implement programs which address the needs of their low-income population. Further, program administrators express concern regarding selection of a formula to distribute funds equitably among States.

The ERS report concentrates on the problem of developing a formula for funding distribution. Five funding formulas were developed and the projected appropriations received by an area were compared to the actual funding level in 1979 to determine the impact of each proposed distribution formula.