

## Nutrition Claims in Advertising and Food Production Trends

Pauline M. Ippolito, Federal Trade Commission<sup>1</sup>  
Alan D. Mathios, Cornell University<sup>2</sup>

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This paper analyzes trends in the production of foods that vary by fat content to determine whether information linking fat consumption to disease may have affected consumers' food choices. It also examines whether the change in regulatory policy in 1984, which allowed producers to link diet and disease in advertising and labeling is correlated with improvements in food choices, or as many critics of the regulatory change feared, to confusion sufficient to slow improvements in diet.

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### Introduction

Diet is believed to be linked substantially to five of the top ten causes of death in the U.S. (U.S. Surgeon General (1988)). The question of how best to get developing information about diet and health to consumers has been much debated in policy circles, especially as it relates to producers' role in disseminating this type of information. This debate has culminated in the recent passage of the Nutrition Labeling Education Act, which will result in sweeping changes in the regulations governing the types of claims producers are permitted to use in food labeling.

This paper focuses on trends in the production of foods that vary in fat and cholesterol content to determine whether information linking fat and cholesterol consumption to heart disease and cancer may have affected consumers' food choices. This study also attempts to determine if the change in the policy governing producer claims in late 1984, which allowed producers to play a role in spreading information linking diet to disease risks, appears to have led to improvements in food choices, or as many critics have feared, to confusion sufficient to slow improvements in diet that would have otherwise occurred.

Critics of producer health claims contend that the rapid increase in the number of health

claims has been detrimental to the American public. For example, a consumer advocacy group stated in a recent submission to FDA, "It is widely acknowledged, however, from this chaotic, deregulatory period, that bombarding consumers with a plethora of claims is not the best method of educating the public about the relationship between diet and health. The marketplace free-for-all that resulted prompted Congress to pass the NLEA in order to limit claims to those the FDA believes are appropriate." (CSPI (1992))

Similarly, the Secretary of Health and Human Services has characterized this period as one of "mayhem" where "the grocery store has become a Tower of Babel, and consumers need to be linguists, scientists and mind readers to understand the many labels they see." (HHS News (1990).

Yet despite the widespread skepticism of producer-provided information, almost no empirical work has been undertaken examining the relationship between producer claims and dietary choices of consumers. In a study of the ready-to-eat cereal market Ippolito and Mathios (1989, 1990), found that producer health claims had an important information effect, leading to significant increases in the consumption of fiber cereals and in the development of new types of fiber cereals. This paper extends the examination of information dissemination by focusing on issues related to fat and cholesterol consumption.

### Developments in the Market for Fats and Cholesterol

In a study that examines how information spreads in markets, it is important to review when the information under study was available for dissemination and the regulations governing its dissemination.

### Scientific Developments Related to Disease

During the 1930s and 1940s research linking serum cholesterol levels and heart disease emerged. A number of studies found that those

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<sup>1</sup>Economist: This article does not necessarily represent the views of the Federal Trade Commission or any of its members.

<sup>2</sup>Associate Professor - Consumer Economics and Housing

affected with heart disease had higher levels of serum cholesterol than control groups. More evidence relating diet to heart disease through its effect on serum cholesterol developed in the 1950s and 1960s. Since then there has been continuous flow of scientific research supporting these results.

Studies also provide strong support for a relationship between fat intake and the incidence of some types of cancer. In the 1970s substantial evidence developed supporting the relationship between fat intake and breast, prostate and colon cancer.

Information Dissemination to Consumers

Government and General Sources of Diet Information. By the early 1960s, articles were appearing in the popular press discussing the relationship between saturated and polyunsaturated fat consumption, serum cholesterol levels, and heart disease. Articles in the popular press on the relationship between fat and cancer began in the later 1970s.

Government also played a role in disseminating this information. The January 1977 report Dietary Goals for the United States recommended quantitative targets for fat and cholesterol. Similar advice was given to the public in 1980, and revised in 1985, in Dietary Guidelines for Americans, in 1988 in The Surgeon General's Report on Nutrition and Health and in 1989 in Diet and Health: Implications for Reducing Chronic Disease Risk.

Regulatory Constraints on Producers. Some forms of information dissemination were prohibited, however. Manufacturers' use of information linking a dietary component to disease risks was prohibited throughout the 1970s and early 1980s. The ban on health claims by producers was effectively lifted in late 1984, when the Kellogg Co. began a highly publicized advertising and labeling campaign explicitly using the National Cancer Institute's statements on the potential relationship between fiber and cancer to promote its high fiber cereals. This campaign led to a relaxation of the policy towards the use of health claims by producers. After 1984, a number of food manufacturers began to explicitly advertise the relationship between fats and cholesterol consumption and heart disease.

**Methodology and Data**

Methodology

This study uses two approaches to examine how information affected dietary choices during the period prior to producer health claims and the post-advertising period. First, trends in broad food categories that comprise a sizable portion of the diet are examined to determine if consumption shifted away from higher-fat and cholesterol food

categories towards lower-fat and cholesterol categories during the periods under analysis.

The second approach uses more refined tests by focusing on particular food substitutions for which other factors that could affect food choices are not likely to play an important role and where advertising and labeling may have played a more central role. In particular, pairs of foods are chosen that first satisfy the condition there be clear a priori predictions on how the relative trends of the two foods should move in response to the dissemination of the diet-health information, and second, the foods are required to be similar enough (very close substitutes) that potential confounding factors are common to both products, thereby eliminating the importance of controlling for these factors.

Given the aggregated level of USDA production data, the requirement that foods be close substitutes sharply limits the number of products that can be analyzed with this second approach.

Data and Empirical Specification

Annual per capita production data for red meat, poultry, fish, eggs, milk and cream products, cheese, fats and oils, flour and cereal products, vegetables and fruit, butter and margarine, ice cream, ice milk and other frozen dairy products (which includes frozen yogurt) were obtained from the USDA's Food Consumption, Prices, and Expenditures, 1970-90. Data for cottage cheese, by type, and for the fat content of frozen dairy products were obtained from Dairy Products Annual Summary for the years 1977 through 1990.

For each food group the changes in production were analyzed between the years 1977-1985 (the pre-health-claim period) and 1985-1990 (the post-health-claim period). Simple regression analyses are used to determine whether statistically significant changes occurred between the two periods. The regression model is given by:

$$Prod_{it} = a_{0i} + a_{1i}YEAR_t + a_{2i}D8590 + a_{3i}YEAR_t * D8590 + e_{it}$$

where

$Prod_{it}$  = Per capita production of food i in

year t,

$YEAR_t$  = the year t, for t=77,...,90,

D8590 = 1 during the health claims period,

= 0 otherwise,  $a_{0i}, \dots, a_{3i}$

= coefficients to be estimated for each food i,

$e_{it}$  = normally distributed error term for food i in year t. (1)

The evidence is consistent with the hypothesis that government and general sources of information had an ongoing effect in informing consumers if high-fat foods exhibit a downward trend across the various foods analyzed, that is,

the coefficient  $a_1$  is significantly negative. The evidence is consistent with the hypothesis that the addition of health claims advertising and labeling added to the dissemination of information if the decline in high fat foods accelerated during the period, that is, if the coefficient on  $a_3$  is significantly negative.

**Results**

Trends in Production for Major Food Categories

Meat, Poultry, Fish and Egg Products. Per capita production for red meat, poultry, fish and eggs is given in Table 1 for the years 1977-1990. The regression results in Table 1 indicate a significant decline in per capita red meat production during the government period and a significant acceleration of the decline during the health claims period.

The results also reveal a significant positive trend in per capita poultry production during the government period and a significant increase in this production trend during the health claims period.

Table 1  
Per Capita Production of Red Meat, Poultry, Fish and Eggs (Pounds per Year)

Year	Red Meat	Poultry	Fish	Eggs
1977	132.2	35.9	12.6	33.9
1978	127.5	37.3	13.4	34.5
1979	124.4	40.0	13.0	35.1
1980	126.4	40.6	12.4	34.4
1981	125.1	41.9	12.6	33.6
1982	119.8	42.0	12.4	33.5
1983	123.9	42.6	13.3	33.0
1984	123.7	43.7	14.1	33.0
1985	124.9	45.2	15.0	32.4
1986	122.2	47.1	15.4	32.2
1987	117.4	50.7	16.1	32.2
1988	119.5	51.7	15.1	31.2
1989	115.9	53.6	15.6	29.9
1990	112.4	55.4	15.0	29.6
Intercept	214.80 (7.77)*	-44.22 (-4.74)*	4.93 (0.72)	52.47 (8.45)*
YEAR	-1.11 (-3.24)	1.05 (9.08)*	0.10 (1.18)	-0.23 (-3.00)
D8590	102.17 (1.89)*	-83.92 (-4.59)*	11.44 (0.86)	33.53 (2.76)*
YEAR*D8590	-1.16 (-1.82)	0.99 (4.64)*	-0.11 (-0.71)	-0.39 (-2.78)*
Adj. R-square	.81	.98	.83	.91

DATA. Food Consumption, Prices and Expenditures, 1970-1990, USDA Statistical Bulletin No. 840, p. 28. Boneless, trimmed equivalent production for meat and retail weight for eggs. \*indicates significance at the 5 percent level.

Per capita fish production showed some tendency to increase during the 1977-1985 period, and mixed movements in the health claims period. Regression analysis shows no significant trend toward higher fish production during the 1977-1985 period or during the health claims period.

Finally, the regression results for per capita egg consumption show a significant reduction during the years 1977-1985 and a significant incremental reduction during the health claims period.

Milk and Cream Products. Table 2 shows that per capita milk production declined during the period under analysis. However, the decline masks dramatic trends in the production of whole, lowfat and skim milk.

The regression results indicate that during the government period the downward trend in whole milk production was statistically significant, as

Table 2  
Per Capita Production of Milk and Cream Products (Pounds per Year)

Year	All Milk	Whole Milk	Lowfat Milk	Skim Milk	Cream Products
1977	249.7	167.3	70.5	11.9	5.0
1978	246.0	161.0	73.5	11.5	5.0
1979	242.6	154.8	76.2	11.6	5.1
1980	237.4	146.4	79.4	11.6	5.2
1981	233.5	140.0	82.2	11.3	5.3
1982	227.2	133.4	83.2	10.6	5.4
1983	226.5	130.3	85.6	10.6	5.7
1984	227.2	126.8	88.8	11.6	6.2
1985	229.6	123.3	93.7	12.6	6.7
1986	228.6	116.5	98.6	13.5	7.0
1987	226.5	111.9	100.6	14.0	7.1
1988	222.3	105.7	100.5	16.1	7.1
1989	224.3	97.6	106.5	20.2	7.3
1990	221.5	90.3	108.3	22.9	7.1
Intercept	528.7 (21.9)*	631.5 (29.5)*	-123.6 (-9.3)*	20.8 (1.8)*	-7.0 (-3.5)*
YEAR	-3.6 (-12.13)*	-6.0 (-22.8)*	2.5 (15.3)*	-0.1 (-0.8)	0.2 (6.1)*
D8590	-159.2 (-3.4)	45.9 (1.1)	-16.5 (-0.6)	-188.5 (-8.3)	6.8 (1.7)*
YEAR*D8590	2.0 (3.6)*	-0.5 (-1.0)	0.2 (0.8)	2.2 (8.4)*	-0.1 (-1.5)
Adj. R-square	.95	.99	.99	.94	.97

DATA. Food Consumption, Prices and Expenditures, 1970-1990, USDA Statistical Bulletin No. 840, Table 13, p. 40.

\* indicates significance at 10 percent level

was the upward trend in lowfat milk. Skim milk production showed no trend during the government period. The downward trend in whole milk production and the upward trend in lowfat milk production continued at essentially the same pace during the advertising period, while the increase in skim milk production showed a marked acceleration.

The evidence on cream products shows a somewhat different pattern. Regression results shown in Table 2 indicate that, contrary to expectations there was a significant rate of increase during the government period. This rate of increase fell during the health claims period, though this improvement is not quite significant at conventional level.

Cheese Production. Table 3 gives per capita cheese production for Italian cheeses and all other cheeses. The regression results indicate that the growth in per capita Italian cheese production was statistically significant during the government period, as was the increase in the rate of growth during the advertising period. For non-Italian cheese, the regression results indicate a statistically significant growth in

Table 3  
Per Capita Production of Cheese (Pounds per Year)

	Italian Cheese	All Other Cheese	All Other\ USDA Donations
1977	3.73	12.3	.53
1978	4.07	12.8	.31
1979	4.24	12.9	.19
1980	4.44	13.1	.79
1981	4.45	13.7	.86
1982	4.84	15.1	2.04
1983	5.29	15.3	2.75
1984	5.77	15.7	2.37
1985	6.46	16.1	2.67
1986	6.99	16.1	2.33
1987	7.63	16.5	2.50
1988	8.13	15.6	1.05
1989	8.50	15.3	.27
1990	9.10	15.6	.08
Intercept	16.66 (-9.28)*	-28.01 (-6.53)	-10.85 (-2.26)
YEAR	0.26 (11.84)	0.52 (9.76)*	0.30 (4.85)*
D8590	-21.11 (-6.00)*	58.81 (7.00)*	9.45 (0.75)
YEAR*D8590	0.26 (6.24)*	-0.69 (-7.03)	-0.11 (0.75)
USDA-CHES	--	--	0.61 (4.26)*
Adj.R-squ	.99	.94	.98

DATA. Food Consumption, Prices and Expenditures, 1970-1990. USDA Statistical Bulletin No. 840, pp. 41 & 83. \* indicates significance at 5 percent level.

production during the government period and a highly significant decline in the rate of growth during the advertising period.

In interpreting these results, a note of caution is warranted. During the period under analysis, non-Italian cheese products were donated to consumers under USDA food programs. As one simple test of the potential confounding effect of these stabilization programs, Table 3 also reports the trend model for all other cheeses with a control for the USDA cheese donations. Though magnitudes have changed somewhat, the signs on the coefficients remain the same.

Fats and Oils. The regression results in Table 4 indicate that both vegetable- and animal-based fats exhibit a statistically significant positive trend during the government period and a statistically significant decline in the trend during the advertising period. The results also show that the decline in animal-based fats during the advertising period is a more significant decline than for vegetable-based fats. Thus, in addition to the significant shifting from animal- to vegetable-based fats, the evidence shows that total fat consumption began to fall significantly once the policy on health claims was changed, reversing a positive trend in the data during the government information period.

Table 4  
Per Capita Production Fats & Oils (Pounds per Year)

Year	Animal Fat	Vegetable Fat	Total Fat
1977	10.6	42.7	53.3
1978	10.6	44.1	54.9
1979	11.5	44.9	56.4
1980	12.3	44.8	57.1
1981	11.7	45.7	57.4
1982	11.4	46.8	58.2
1983	12.1	47.9	60.0
1984	12.4	46.4	58.8
1985	13.3	50.9	64.2
1986	12.6	51.7	64.3
1987	11.1	51.8	62.9
1988	10.8	52.2	63.0
1989	10.6	50.5	61.1
1990	10.2	52.5	62.7
Intercept	-5.84 (-1.08)	-3.94 (-0.42)	-9.78 (-1.01)
YEAR	0.22 (3.23)*	0.61 (5.27)*	0.83 (6.89)*
D8590	71.78 (6.78)*	43.54 (2.37)*	115.32 (6.07)*
YEAR*D8590	-0.84 (-6.78)*	-0.48 (-2.22)*	-1.32 (5.92)*
Adj. R-square	.77	.95	.95

DATA. Food Consumption, Prices and Expenditures, 1970-1990. USDA Statistical Bulletin No. 840, p. 42. \* indicates significance at 5 percent level.



Flour and Cereal Products. Table 5 displays per capita production of flour and cereal products (which are both recommended for increased consumption as a replacement for fats). The regressions show that per capita production increased significantly during both periods under analysis and that the growth in the post-1985 period accelerated significantly.

Table 5  
Per Capita Production of Flour & Cereal, Select Vegetables & Fruit (Pounds per Year)

Year	Flour & Cereal	Vegetables <sup>1</sup>	Fruit <sup>1</sup>
1977	141.2	192.2	97.0
1978	139.6	184.5	99.5
1979	145.9	191.2	98.5
1980	145.8	190.3	105.0
1981	146.7	183.6	99.6
1982	149.2	186.9	101.4
1983	149.1	185.7	105.6
1984	150.4	202.0	103.7
1985	157.5	197.4	102.1
1986	163.7	195.0	109.0
1987	172.5	201.5	115.0
1988	174.3	202.6	112.6
1989	174.9	212.3	113.4
1990	183.0	213.8	106.7
Intercept	28.40 (1.10)	143.43 (2.32)*	24.13 (0.53)
YEAR	1.46 (4.57)*	0.57 (0.75)	0.96 (1.71)*
D8590	-264.67 (-5.25)*	-277.16 (-2.29)*	1.28 (0.01)
YEAR*D8590	3.19 (5.42)*	3.29 (2.32)*	0.01 (0.01)
Adj.R-square	.98	.74	.60

DATA. Food Consumption, Prices and Expenditures, 1970-1990. USDA Statistical Bulletin No. 840. pp. 28, 43-44, 46 and 53-54. \*indicates significance at 10 percent level; <sup>1</sup> Includes select fresh, canned/chilled and frozen fruit and fresh and processed vegetables currently reported by USDA.

Fruits and Vegetables. Table 5 gives per capita production of fruits and vegetables, also foods recommended for increased consumption in place of fats. Regression results indicate positive trends during the government period for both vegetables and fruit, though the trend was statistically significant only for fruit. These trends both increased during the advertising period, though the increment to the trend is significant only for vegetables.

Summary of Trends in Major Food Categories. Examination of per capita production data for major food categories of interest during the years 1977-1985, when health claims were prohibited, provides some substantial evidence that

information about fat, cholesterol and disease was spreading to consumers, leading to improvements in some important aspects of diet. The evidence for this period is not entirely consistent, however. Per capita production of some higher-fat dairy products (cheese and cream products) and fats and oils also increased during the government period, contrary to expectations based on information effects alone.

The production evidence for major food groups provides a more consistent picture during the 1985-1990 period of analysis, when the policy was changed to allow producers to use health claims. During this period, per capita production from food categories with the highest fat levels either stayed on the trend that existed during the government period or experienced a decline in the trend relative to the earlier period. None of the increments to the trends was contrary to expectations under our information hypotheses, and thus, the production data for broad food categories provide no evidence consistent with the view that the addition of health claim advertising had adverse effects on dietary patterns. In fact, during the advertising period movements away from the high-fat food categories increased for all categories, except Italian cheese. Similarly, the production data show a consistent pattern during the advertising period of additional movements towards lower-fat food categories.

Changes in Production for Selected Food Substitutions

This section analyzes three pairs of specific food substitutes for which data are available and for which costs and other noninformation issues are likely to affect the products relatively equally.

Butter and Margarine. Table 6 gives per capita production of butter and margarine products for the periods under analysis. The per capita amount of fat used in the production of margarine products is also given, which reflects changes in the average type of margarine product over time. Finally, Table 6 also lists USDA annual donations of butter on a per capita basis.

Table 6  
Per Capita Production of Butter & Margarine Products (Pounds per Year)

Year	USDA Butter Donations	Butter	Margarine	Fat in Margarine
1977	.4	4.3	11.4	9.2
1978	.3	4.4	11.3	9.0
1979	.4	4.5	11.2	9.0
1980	.5	4.5	11.3	9.0
1981	.5	4.2	11.1	8.8
1982	.6	4.3	11.0	8.6
1983	1.1	4.9	10.4	7.9
1984	1.1	4.9	10.4	7.8
1985	1.0	4.9	10.8	8.2

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1986	.8	4.6	11.4	8.5		
1987	1.0	4.7	10.5	8.0		
1988	.8	4.5	10.3	7.7		
1989	.9	4.4	10.2	7.6		
1990	.7	4.4	10.9	8.6		
Intercept	-1.1	7.8	22.8	12.3	24.5	13.3
	(-0.5)	(3.5)*	(5.7)*(2.0)	(5.8)*(2.0)*		
YEAR	0.1	-0.1	-0.1	-0.2	-0.0	
	(2.5)*	(-1.7)*	(-2.9)*	(-0.1)	(-3.7)*	(-0.6)
D8590	13.9	-0.1	-3.9	12.7	-15.1	2.4
	(3.1)*	(-0.0)	(-0.5)	(1.2)	(-1.8)*	(0.2)
YEAR*D8590	-0.2	0.0	0.1	-0.1	0.2	-0.0
	(-3.1)*	(0.1)	(0.6)	(-1.2)	(1.9)*	(-0.2)
USDA-Butter	--	1.0	--	1.2	--	1.3
		(4.8)*		(-2.1)*		(2.1)*
Adj. R-square	.39	.81	.45	.59	.61	.7

DATA. Food Consumption, Prices and Expenditures, 1970-1990. USDA Statistical Bulletin No. 840, p. 42; and Fats and Oils. U.S. Dept of Commerce. Annual. Table 3A \* indicates significance at 5 percent level. Most margarine products are 40-80 percent fat.

Surprisingly, per capita butter production increased during the government/general information period. USDA donations of butter also rose substantially during this period, however. Controlling for USDA donations, the butter regression indicates that the underlying trend in butter consumption was negative and significant during the pre-advertising period, as expected.

By 1990, per capita butter production was almost back down to its 1977 level. In part, this reduction again reflects lower government donations. As shown in the regression controlling for USDA butter donations, the underlying trend towards lower butter consumption continues unchanged during the advertising period.

Per capita production of margarine products declined during both periods of analysis. The per capita fat content of margarine products declined even more as the fat content of margarine shifted to lower-fat products, from 9.2 pounds in 1977, to 8.2 pounds in 1985, to 7.6 pounds in 1989, though the 1990 data shows a substantial increase.

For both margarine products and for the fat in margarine products, the regression results indicate a negative (but quite insignificant) trend in per capita production during the government/general information period, controlling for USDA donations. These results also indicate no significant change in the negative trend for both during the advertising period.

Taken together, these results are consistent with the hypothesis that, controlling for government butter donations, government and

general information had some effect in lowering butter and margarine sales, other things equal, though these results are statistically insignificant for margarine. The results are also consistent with the hypothesis that margarine consumption did not change significantly once the ban on producer claims was removed. Finally, controlling for government butter donations, these results do not support the hypothesis that the dissemination of information about the health benefits of the lower saturated fat content of high-fat margarine products lead to an increase in the total demand for margarine products.

Ice Cream and Ice Milk. Table 7 gives per capita production of ice cream and ice milk. The regression results indicate that during the government period the trend in ice cream production was positive but insignificant, and this trend showed a significant reversal during the health claims period. Similarly, the results for ice milk show a significant negative trend in ice milk production during the government period and a significant reversal of this trend during the advertising period.

Table 7  
Per Capita Production of Ice Cream, Ice Milk & Cottage Cheese (Pounds per Year)

Year	Ice Cream	Ice Milk	Creamed Cottage Cheese	Lowfat Cottage Cheese
1977	17.6	7.7	3.99	0.63
1978	17.6	7.7	3.82	0.69
1979	17.3	7.3	3.73	0.70
1980	17.5	7.1	3.62	0.79
1981	17.4	7.0	3.36	0.91
1982	17.6	6.6	3.23	0.94
1983	18.1	6.9	3.17	0.92
1984	18.2	7.0	3.11	0.97
1985	18.1	6.9	3.00	1.02
1986	18.4	7.2	2.93	1.10
1987	18.3	7.4	2.78	1.11
1988	17.3	8.0	2.64	1.19
1989	16.1	8.4	2.31	1.22
1990	15.7	7.7	2.12	1.21

Intercept	10.48	17.80	-14.18	-3.36
	(2.12)*	(4.93)*	(16.58)*	(-8.09)*
YEAR	0.09	-0.13	-0.13	0.05
	(1.46)	(-2.95)*	(-12.49)*	(10.06)
D8590	56.59	-30.70	4.37	1.17
	(5.86)*	(-4.34)*	(2.61)*	(1.44)*
YEAR*D8590	-0.66	0.37	0.05	-0.01
	(-5.83)*	(4.43)*	(-2.52)*	(-1.46)*
Adj. R-square	.74	.66	.98	.97

DATA. Food Consumption, Prices and Expenditures, 1970-1990. USDA Statistical Bulletin. No. 840. p. 39; Dairy Products Annual Summary. Table 47. \*indicates significance at 5 percent level.

Creamed and Lowfat Cottage Cheese. Creamed cottage cheese has at least 4.0 percent milkfat, while lowfat cottage cheese has less, usually .5 percent or 2.0 percent milkfat. The regression results in Table 7 indicate that the production of creamed cottage cheese declined significantly during the government period and declined significantly further during the advertising period. The results for lowfat cottage cheese show a significant increase in production during the government period, with a negative but insignificant change in the trend during the advertising period.

Thus, the evidence on cottage cheese production again indicates a shift from the higher-fat product to the lower-fat product, and a reduction in the total fat consumed in cottage cheese products, which began prior to the health claims period and was significantly increased during the health claims period.

#### Summary and Conclusion

Examination of specific food substitutions supports the hypothesis that during the health claims period movements towards lower-fat substitutions accelerated compared to the movements during the government period. These results, combined with the evidence from the examination of broad food categories, provide no evidence that the use of health claims in advertising and labeling had adverse effects on diet. On the contrary, most of the evidence suggests that the use of producer health claims may have been an added source of information and led to improvements in the diet.

The motivation for this study was to provide some evidence on fat and cholesterol in the diet before and after the controversial period following the relaxation of the ban on health claims. Evidence on this matter is important because many provisions of the NLEA are based on the assumption that the use of producer health claims had detrimental effects on the marketplace. Yet in the over 500 pages of proposed regulations, there is almost no evaluation of the effect of previous or current labeling policies on diet.

The presumption that the marketplace has become a "Tower of Babel" has led to some provisions in the NLEA that closely resemble the labeling policies of the 1970s. For example, in the proposed regulations, it will be illegal for manufacturers to make claims regarding developing nutrient-disease relationships. Moreover, even for allowed claims, the number of food products that will be permitted to make claims is very limited, so limited that many fat-free bread and cereal products will not be permitted to make claims linking low fat diets to heart disease or cancer. The evidence presented in this paper provides some evaluation of advertising and

labeling policy and suggests caution in the adoption of many of the proposals outlined in FDA's implementation of the NLEA. In other work, we address the specific provisions of the NLEA and assess its potential to help or hinder consumer understanding of the impact of diet on health.

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