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## Trends in Food Label Use Associated With New Nutrition Labeling Regulations

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### Introduction

In 1990, the United States Congress passed the Nutrition Labeling and Education Act,<sup>1</sup> and new food labels were introduced in May 1994. New regulations now limit health claims, and new labels use standardized portion sizes and focus on nutrients associated with chronic diseases. It was hoped that these changes would help consumers make more healthful food choices.<sup>2,3</sup>

Most research evaluating food labels has found that labels before 1994 were difficult to use because formats were confusing and content claims (e.g., "lite") were inconsistent.<sup>4-7</sup> Since the new labels were designed to improve these characteristics, it is important to learn whether use and comprehension of labels has increased. Here we examine evidence that new food labels have increased consumers' use of nutrition information on packaged foods. We compare responses to 2 population-based surveys completed before and after introduction of the new labels to address 3 questions: (1) Has there been an increase in the proportion of persons reading and using nutrition labels? (2) Have there been changes in the information people most often use? and (3) Do people report fewer barriers to using nutrition labels?

### Methods

Data were from the Washington State Cancer Risk Behavior Survey, a random-digit-dial survey of adults (18 years and older) to monitor attitudes and behavior related to cancer risk and prevention.<sup>8</sup> We used two cross-sectional surveys, the first completed between August 1992 and August 1993 (n = 1001) and the second between September 1995 and September 1996 (n = 1450), to characterize food label use before and after the introduction of the new label format. These are described below as the 1993 and 1996 surveys, respectively. Telephone numbers were purchased from GENESYS Sampling Systems.<sup>9</sup> To complete

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## ABSTRACT

**Objectives.** This study compared use of food labels before and after implementation of new Food and Drug Administration regulations in 1994.

**Methods.** Data were obtained by random-digit-dial surveys of Washington State residents in 1993 (n = 1001) and 1996 (n = 1450).

**Results.** After implementation of the new regulations, usual label use increased significantly, by 8.5 percentage points in women and 11.3 percentage points in men. More respondents looked for information on fat content and fewer failed to use labels because they "take too much time" or "are too hard to understand."

**Conclusions.** Use of food labels and satisfaction with their content have increased, but 70% of adults still want labels to be easier to understand. (*Am J Public Health*. 1998;88:1212-1215)

**TABLE 1—Percentages of Consumers in Washington State Using Food Labels Before (1993) and After (1996) Introduction of New Label Format, by Sex, Age, and Education**

	Year	Women					Men					
		(n)	Usually	Sometimes	Never	<i>P</i> <sup>a</sup>	(n) <sup>b</sup>	Usually	Sometimes	Never	<i>P</i> <sup>a</sup>	
Age, y	18–34	1993	(179)	34.8	54.2	11.1	.04	(141)	13.5	63.8	22.8	<.001
		1996	(255)	44.2	41.2	14.7		(185)	29.2	45.7	25.1	
	35–59	1993	(238)	33.2	54.1	12.7	<.01	(223)	15.8	53.6	30.6	
		1996	(439)	47.2	42.6	10.2		(320)	26.5	48.8	24.7	
	60+	1993	(136)	36.3	45.4	18.3	NS	(81)	20.2	49.2	30.7	
		1996	(169)	31.6	51.6	16.9		(80)	23.9	36.3	39.9	
Education, y	12	1993	(229)	30.1	52.9	17.1	NS	(166)	12.5	52.7	34.8	
		1996	(271)	36.2	42.2	21.7		(157)	21.2	38.3	40.5	
	13–15	1993	(188)	37.9	50.1	12.0	NS	(118)	20.0	51.8	28.3	
		1996	(367)	45.0	45.0	10.0		(227)	25.4	50.5	24.2	
	16+	1993	(136)	37.3	53.6	9.2	NS	(161)	15.6	65.2	19.2	
		1996	(224)	47.7	45.3	7.0		(200)	33.4	45.8	20.8	
Total sample	1993	(553)	34.5	52.1	13.5	<.01	(445)	15.6	56.7	27.6		
	1996	(863)	43.0	44.1	13.0		(585)	26.9	45.7	27.4		

Note. Percentages are adjusted to the state census. NS = not significant.

<sup>a</sup>*P* value of  $\chi^2$  tests of 1993 vs 1996.

<sup>b</sup>Excludes 3 respondents in 1993 and 2 in 1996 who did not answer this question.

interviews with 1 adult selected randomly from each household, we made up to 14 attempts within 1 month and, if necessary, made an additional 11 attempts 3 months later. The conservatively estimated effectiveness rates (completed interviews divided by known plus estimated eligible respondents) were 61.1% in 1993 and 63.5% in 1996, which are similar to rates reported for similar surveys.<sup>10</sup>

Both surveys consisted of a set of core questions on demographic characteristics and attitudes and behavior related to cancer risk (diet, smoking, screening), with an additional 3 sets of items on nutrition label use. The first of these asked how often respondents used labels when purchasing packaged foods and whether, when used, the labels gave desired information. The second asked how often respondents looked for 14 types of information on labels. The third asked about barriers to label use, specifically reasons respondents did not use labels and what aspects of labels they would like changed. (Survey instruments are available from the authors.)

All results are adjusted for sampling probability and to the intercensal estimates of the age-, sex-, and county-specific Washington State population to be representative of the state's population. Statistical tests are based on weighted data, with the weights standardized so that the sum of the weights equaled the number of persons interviewed. We used  $\chi^2$  statistics to test differences between 1993 and 1996 and used *P* < .05 as the criterion for statistical significance.

**TABLE 2—Percentages of Consumers in Washington State Looking for Specific Information on Nutrition Labels Before (1993, n = 795) and After (1996, n = 1188) Introduction of New Label Format**

	Year	Usually	Sometimes	Never	<i>P</i> <sup>a</sup>
Nutritional information					
Salt	1993	48.2	22.7	29.1	NS
	1996	44.9	25.3	29.8	
Chemical additives	1993	39.1	28.0	33.0	NS
	1996	42.1	27.3	30.6	
Vitamins	1993	39.3	29.3	31.4	.03
	1996	40.9	33.0	26.1	
Cholesterol	1993	55.2	22.7	22.1	.05
	1996	60.5	21.1	18.5	
Fiber	1993	31.4	33.9	34.7	<.01
	1996	38.0	31.8	30.2	
Calories	1993	58.4	24.4	17.2	<.001
	1996	68.6	19.2	12.2	
Serving size	1993	33.7	22.4	44.0	<.001
	1996	44.8	20.8	34.3	
Fat	1993	69.0	19.5	11.7	<.001
	1996	83.8	11.8	4.5	
% Calories from fat <sup>b</sup>	1993	49.2	25.8	25.0	...
% Daily value for fat <sup>c</sup>	1996	38.5	23.0	38.4	...
Other label information					
Approved by health professionals	1993	12.1	18.8	69.1	<.01
	1996	9.1	15.4	75.5	
Consistent with low-fat diet	1993	40.8	25.3	33.8	.02
	1996	36.5	23.4	40.2	
"Light or "reduced fat"	1993	44.3	20.2	35.6	NS
	1996	41.3	24.2	34.5	

Note. Percentages are adjusted to the state census. NS = not significant.

<sup>a</sup>*P* value of  $\chi^2$  test of 1993 vs 1996.

<sup>b</sup>On label in 1993 only.

<sup>c</sup>On label in 1996 only.

**TABLE 3—Percentages of Consumers in Washington State Citing Barriers to Using Nutrition Labels Before (1993) and After (1996) Introduction of New Label Format, by Education and Age**

	Total Sample	Education			Age			
		≤12	13–15	16+	18–34	35–59	60+	
	(1993 n) (1996 n)	(1001) (1450)	(396) (429)	(307) (595)	(298) (424)	(320) (440)	(462) (760)	(219) (250)
<b>Reasons for not using labels</b>								
Takes too much time	1993 1996	42.0 31.7***	50.9 40.1**	35.0 27.8*	37.3 28.4**	43.1 28.3***	42.0 31.6***	39.8 37.6
Too hard to understand	1993 1996	45.9 34.0***	54.9 43.8***	40.6 33.6*	35.2 24.9**	43.2 28.1***	46.6 36.2***	49.3 37.9*
Print too small	1993 1996	46.6 36.4***	51.9 45.8	43.6 33.6**	42.5 30.6***	24.4 12.0***	55.1 41.5***	68.9 61.6
Not interested	1993 1996	26.6 25.1	28.2 31.2	25.8 23.6	25.5 21.1	31.8 30.7	25.4 22.6	19.7 22.6
<b>Changes wanted</b>								
Easier to understand	1993 1996	74.5 69.8**	79.5 80.3	76.1 71.1	65.9 57.7*	71.7 64.4*	75.9 69.4*	76.7 79.5
More on fat	1993 1996	72.9 60.6***	73.9 71.2	72.8 63.3**	71.8 46.4***	70.6 57.5***	74.6 58.4	73.7 71.6
More on additives	1993 1996	81.1 80.0	83.3 84.8	83.1 83.5	75.7 70.7	82.6 79.8	81.3 78.0	77.7 86.0*
More on low fat/low cholesterol	1993 1996	75.7 74.4	77.7 78.5	75.4 78.9	73.2 64.4*	76.6 70.7*	75.9 73.9	73.4 82.0*

Note. Percentages are adjusted to the state census.

\* $P < .05$ ,  $\chi^2$  tests of 1993 vs 1996.

\*\* $P < .01$ ,  $\chi^2$  tests of 1993 vs 1996.

\*\*\* $P < .001$ ,  $\chi^2$  tests of 1993 vs 1996.

## Results

In the unweighted samples of 1993 and 1996 survey respondents, respectively, the mean ages were 44.8 and 44.1 years; 44.8% and 40.5% were male; 90.7% and 89.9% were White; 62.6% and 71.8% had household incomes over \$25 000; 29.8% and 29.3% had 16 or more years of education; and 39.6% and 29.6% had 12 or fewer years of education.

Table 1 gives the population-weighted percentages of Washington State residents who, in 1993 and 1996, reported usually, sometimes, and never using food labels. There was a 9-percentage-point increase in usual label use among women and an 11-percentage-point increase among men (both  $P$ 's  $< .01$ ). These increases were due to shifts from some-time to usual use, as there were no changes in the percentages who never used labels. For women and men younger than age 60, usual label use increased by about 13 percentage points, compared with small, nonsignificant changes in those aged 60 and older.

Responses to several questions suggested that consumers noticed and liked the new food labels. In 1993, 46.2% of women and 42.0% of men who at least sometimes read labels reported that they usually found information they were seeking. In 1996, these percentages increased to 62.4% and 58.4%, respectively (for both changes,  $P < .001$ ). In 1996, 75.6% of women and 69.3% of men who at

least sometimes used food labels said that they noticed the new label format. Of those who noticed the new format, 82.7% of women and 83.6% of men said that the labels were more helpful, and only 1.4% and 0.9% found them less helpful.

Table 2 gives results on types of food label information sought by Washington State residents. There were large increases, ranging from 10 to 14 percentage points, in the percentages looking for information on calories, serving size, and fat. There were modest increases, ranging between 1 and 8 percentage points, in those looking for information on vitamins, cholesterol, and fiber, and no changes in the percentages of those looking for information on salt and chemical additives. In 1996, almost 84% looked for information on fat, followed by 69% for calories and 61% for cholesterol. Two noteworthy changes in label information between 1993 and 1996 were the introduction of percentage of daily value to describe proportion of daily requirements and the elimination of percentage of calories from fat. While almost 75% of those using labels in 1993 at least sometimes looked for percentage of calories from fat, in 1996 only 62% looked for percentage of daily value for fat.

Table 3 gives results on barriers to using nutrition labels. In both years, approximately a quarter of Washington State residents were not interested in using labels. The other principal reasons cited for not using labels, "takes

too much time," "too hard to understand," and "print too small to read," each decreased significantly, by approximately 10 percentage points, and these decreases tended to be larger among those under age 60.

In both years, a high percentage of Washington State residents wanted changes in food labels (Table 3). In 1993, almost 75 percent of residents wanted labels to be easier to understand, and this proportion decreased by only 4.7 percentage points after introduction of the new labels. More than 75 percent wanted more information about consistency with low-fat or low-cholesterol diets and about food additives, and this proportion did not decrease significantly after the introduction of the new labels. There was, however, a 12-percentage-point decrease in the percentage who wanted more information on fat. Changes in the proportion of consumers wanting more information on fat and on low-fat or low-cholesterol diets differed by both education and age. The percentages of younger and better-educated residents who wanted this information decreased in 1996, whereas there were increases or little change among those who were older and less educated.

## Discussion

This study found positive effects of new food labels on several measures related to

label use and comprehension. Between 1993 and 1996, usual label use increased by 9 percentage points in women and by 11 percentage points in men, and significantly fewer people found labels confusing, burdensome, and difficult to read. Label users also responded to the changed emphasis on nutritional factors related to chronic disease, as more used information on fat, cholesterol, serving size, and energy. However, even after the label changes, more than 70% of residents still wanted labels to be easier to understand. We also found that changes in label use were not consistent across age and education groups. There was little or no change in label use and satisfaction among residents aged 60 and older, and both older and less well educated residents were more likely than others to find labels too difficult to understand.

Only a single report has addressed changes in label use since the introduction of new labels in 1994.<sup>11</sup> That study found that between 1992 and 1995, the percentage of food shoppers who almost always used nutrition labels increased from 52% to 61%, and there were increases in use of information on fat, energy, and serving size. These results are similar to our findings and provide further support for a positive impact of new food labels. However, changes in label use are not solely attributable to the new label format. There are likely secular trends in label use beginning well before the new labels were introduced. Between 1982 and 1988, Bender and Derby<sup>12</sup> found that the proportion of consumers using nutrition labels increased from 68% to 74%

of the US population, with increasing use of information on fat and cholesterol.

An important caveat with regard to interpreting results of this study is that the data are from 2 cross-sectional surveys, each having a response (efficacy) rate of about 62%. While in earlier studies we found few significant differences among survey respondents who were easy to reach and those who were difficult to reach, nonresponse in a telephone health survey is likely associated with poorer health-related behavior.<sup>8</sup> Thus, these results may overestimate label use and the impact of the new labels on consumers' use and comprehension.

In summary, we found evidence of modest, positive impacts of new food labels on use, barriers to use, and satisfaction. It is important to note that the percentages of residents who never used labels did not change, and that more than 70% of the respondents wanted new labels to be easier to understand. The impact of the Nutrition Labeling and Education Act could be enhanced by further label modifications to make labels easier to understand and by programs to help consumers, especially older and less well educated consumers, interpret label information. □

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