



# 1% low-fat milk has perks!: An evaluation of a social marketing intervention

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## ABSTRACT

This study evaluated the effect of a 12-week social marketing intervention conducted in 2012 promoting 1% milk use relying on paid advertising. Weekly milk sales data by type of milk (whole, 2%, 1%, and nonfat milk) were collected from 80 supermarkets in the Oklahoma City media market, the intervention market, and 66 supermarkets in the Tulsa media market (TMM), the comparison market. The effect was measured with a paired *t*-test. A mixed segmented regression model, controlling for the contextual difference between supermarkets and data correlation, identified trends before, during, and after the intervention. Results show the monthly market share of 1% milk sales changed from 10.0% to 11.5%, a 15% increase. Evaluating the volume sold, the monthly mean number of gallons of 1% milk sold increased from 890.5 gal (*SD* = 769.8) per supermarket from before the intervention to 1070.7 gal (*SD* = 922.5) following the intervention ( $t(79) = 9.4, p = 0.000$ ). Moreover, average weekly sales of 1% milk were stable prior to the intervention ( $b = -0.2$  gal/week, 95% CI [-0.6 gal/week, 0.3 gal/week]). During each additional week of the intervention, 1% milk sales increased by an average of 4.1 gal in all supermarkets (95% CI [3.5 gal/week, 4.6 gal/week]). Three months later, albeit attenuated, a significant increase in 1% milk sales remained. In the comparison market, no change in the market share of 1% milk occurred. Paid advertising, using the principles of social marketing, can be effective in changing an entrenched and habitual nutrition habit.

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## 1. Introduction

Most Americans consume high-fat milk, a preference the *Dietary Guidelines for Americans* has sought to change (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2010, 2015). The 2003–2004 National Health and Nutrition Examination Survey documented that 74% of all milk consumed was either whole (32.3%) or 2% milk (41.7%) while 1% and nonfat milk together represented just 26% of milk consumed (10.4% and 15.6% respectively) (Britten et al., 2007). National milk sales data corroborates these findings. In 2003–2004, 71.4% of milk sales were high-fat milk products—36% were sales of whole milk and 35.5% were 2% milk sales. Low-fat milk sales represented 28.6% of all milk sales—12.7% were 1% milk sales and an additional 15.9% were nonfat milk sales (U.S. Department of Agriculture, 2012). The purpose of this research was to test the effectiveness of a social marketing intervention promoting the use of 1% milk, *1% Low-Fat Milk Has Perks!*.

Previous interventions promoting the consumption of low-fat milk have reported mixed results. Of these, the *1% or Less* campaign is the most studied intervention. Initially, this intervention promoting low-

fat milk was implemented in several small, sociodemographically homogenous cities (<35,000 population) in West Virginia, with each campaign testing the effectiveness of a different promotional strategy (Booth-Butterfield and Reger, 2004; Reger et al., 1998, 1999, 2000; Wootan et al., 2005). The *1% or Less* intervention was based on the theory of reasoned action that posits behavior is best predicted by intention, which is determined by attitude and subjective normative beliefs. The intervention promoted the health benefits, price savings, and taste of low-fat milk (Booth-Butterfield and Reger, 2004). Its effect was measured, in part, by the change in mean monthly low-fat milk sales per supermarket from immediately before to immediately following the intervention.

These studies concluded that a combination of paid advertising, public relations, and community-based outreach was most effective in increasing low-fat milk sales (Reger et al., 1998; Wootan et al., 2005). However, the intervention did not produce a significant effect when implemented using paid advertising alone or a combination of community events with public relations (Reger et al., 2000; Wootan et al., 2005). Subsequently, the *1% or Less* campaign was replicated in a primarily Hispanic community in California and the state of Hawaii (Hinkle et al., 2008; Maddock et al., 2007). In both instances, the intervention strategy included community-based events, paid advertising, and print media. In California, the increase in low-fat milk sales was more modest following the *1% or Less* intervention than the similar West Virginia intervention, and the effect was not sustained (Hinkle et al., 2008; Reger et al., 1998).

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Results of the 1% or Less intervention were also mixed when replicated in Hawaii, which, compared to West Virginia, is a large media market with a multi-ethnic population (Maddock et al., 2007). In that intervention, pre- and post-intervention telephone surveys revealed a significant increase in low-fat milk use immediately after the intervention and a modest overall increase three months later. The significant increase in self-reported low-fat milk immediately after the intervention was confined to Whites and Filipinos, and three months later no significant effect by ethnicity was identified. Notably, the failure to identify an effect by ethnicity may have been attributable to small sample sizes.

When taken together, the 1% or Less studies conducted in Hawaii and California raise questions of the generalizability of this intervention. Moreover, the West Virginia studies raise the question whether paid advertising alone can produce a significant change in a nutrition behavior.

The 1% Low-Fat Milk Has Perks! social marketing intervention sought to address these issues. This intervention used paid advertising only to promote 1% milk and was implemented in a large but diverse media market.

Formative research based on seven focus group discussions, and using mixed methods, was conducted in Oklahoma City. That research revealed poor milk nutrition knowledge and myths influenced the type of milk usually chosen. Based on this research, the 1% Low-Fat Milk Has Perks! intervention promoted the following four key messages: 1) 2% is not low-fat milk; 2) 1% low-fat milk is not watered down; 3) 1% low-fat milk has the same nutrients as 2% milk and whole milk; 4) 1% low-fat milk has the same Vitamin D as 2% milk and whole milk. The formative research also revealed that 2% milk consumers were more willing to consider using 1% milk than whole milk consumers. Therefore, we hypothesized that sales of 2% milk would decrease more than sales of whole milk, and that the reduction would be reflected in an increase in the targeted behavior, sales of 1% milk.

## 1. Methods

### 1.1. Design

#### 1.1.1. Intervention and comparison area

The Oklahoma City (OKCMM) and Tulsa (TMM) media markets, the two largest media markets in Oklahoma, were chosen as the intervention and comparison areas, respectively. As the study's comparison area, the TMM received no media exposure or other intervention components. As seen in Table 1 the sociodemographic characteristics of the two media markets are very similar (U.S. Census Bureau, 2016).

#### 1.1.2. Intervention

The 12-week 1% Low-Fat Milk Has Perks! intervention ran from June 11, 2012 to September 2, 2012, relying on television and radio commercials, print advertisements, billboards and bus wraps, point-of-sale promotional items, and digital media. Kendrick Perkins, a professional basketball player with the Oklahoma City NBA franchise, was the celebrity spokesperson.

**1.1.2.1. Television and radio advertising.** Four 30-second television commercials and two 30-second radio commercials ran during the intervention. The television commercials ran 1117 times in English (an average of 14.3 spots per day), and 154 spots were broadcast in Spanish (an average of 1.9 per day). It is estimated that 99% of adults in the English viewing audience (age 18 and older) viewed the television commercials, on average, 24.2 times, and that 23.1% of the Spanish speaking population was reached, and viewed the commercials an average of 4.2 times. Two English radio commercials (454 spots) were broadcast for an average of 5.5 spots per day. On the Spanish radio station, 295 spots aired, an average of 3.6 spots per day. Approximately 37.9% and 18.5% of English and Spanish speaking adults were reached respectively through radio.

**Table 1**

Sociodemographic characteristics of the Oklahoma City and Tulsa media markets (2008–2012 American Community Survey).

	OKCMM	TMM
Total population	1,809,404	1,303,368
Characteristic	%	%
Ethnicity		
White	70.3	67.1
Black	7.8	6.8
American Indian	4.5	8.9
Hispanic	10.0	7.1
Asian	2.3	1.5
Other and mixed race	5.1	8.5
Gender		
Male	49.6	49.2
Female	50.4	50.8
Educational attainment		
Not a high school graduate	13.3	13.0
High school graduate	30.1	31.6
Some college	31.2	32.1
College graduate	25.4	23.4
Marital status (15 and over)		
Not married	49.2	47.2
Married	50.8	52.8
Geographic location		
Urban county	54.0	46.2
Rural county	35.3	42.8
Mixed county	10.7	11.0
Size of household		
1 person	28.2	28.0
2 people	34.8	35.5
3 people or more	36.9	36.5
Percent of population living near poverty		
<100% of FPL	16.1	16.0
100% to 199% of FPL	21.0	21.3
200% of FPL and over	62.9	62.7

**1.1.2.2. Billboards and bus wraps.** Billboards were placed in the Oklahoma City metropolitan area, including three digital billboards plus 73 print billboards donated by a collaborating local supermarket. Advertisements were also displayed on exteriors of six busses and in the interiors of 65 busses that circulated in the Oklahoma City transit system.

**1.1.2.3. Print media.** Twelve print advertisements ran in free community newspapers and magazines that are widely distributed in the metropolitan area.

**1.1.2.4. Point-of-sale promotional items.** Promotional and point-of-sale items included life-size cutouts of Perkins, dairy case clings, souvenir buttons, and a handout with nutrition information entitled 'Lactoid Fac-toids.' In the metropolitan area, these point-of sale items were prominently displayed near dairy cases in 36 supermarkets and placed in seven Oklahoma Department of Human Service centers, two county health department offices, and one local public library. To ensure program fidelity, project staff monitored the availability and placement of point-of-sale items weekly.

**1.1.2.5. Digital media.** Digital media included Pandora, a website, and YouTube. Pandora had 3.35 million impressions, generating 23,963 clicks on the commercials. The interactive website, available in English and Spanish, reinforced the theme of the intervention. From the website home page, 8,296 unique visitors clicked on an icon and received milk nutrition messages. YouTube videos, the 30-second commercials created for television, were viewed 53,000 times.

#### 1.1.3. Supermarket milk sales data

Five grocery chains, representing 146 supermarkets, provided milk sales data, including 80 stores in the OKCMM and 66 stores in the TMM. We calculated each store's total weekly number of gallons sold for whole, 2%, 1%, and nonfat milk. Sales data for buttermilk, flavored,

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