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## Research and Professional Briefs

# Early Effects of the Federally Mandated Local Wellness Policy on School Nutrition Environments Appear Modest in Colorado's Rural, Low-Income Elementary Schools

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**ABSTRACT**

To increase opportunities for healthy eating and physical activity, US school districts participating in the National School Lunch Program were required to create a Local Wellness Policy (LWP) by June 2006. The What's Working project described the initial influence of this mandate on nutrition environments and policies. In 2005 and 2007 (before and after the mandate went into effect), a survey about school features related to nutrition and physical activity was sent to a random sample of 45 low-income, rural elementary foodservice managers and principals.

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Schools averaged 204 students, 27% Hispanic. Districts' LWPs were coded for strength and comprehensiveness. In addition, key informant interviews were conducted with foodservice managers almost 2 years after the LWP went into effect. Three improvements were observed: increases in the percent of schools with policies stipulating predominantly healthy items be offered in classroom parties (21.4% in 2005 vs 48.7% in 2007), daily fresh fruit offerings in the lunchroom (0.80 choices in 2005 vs 1.15 choices in 2007), and the percent of schools using skinless poultry (27% in 2005 vs 59% in 2007). LWPs were weakly worded and rarely addressed energy content. Nutrition guideline elements most commonly addressed included vending machines, school stores, and à la carte food offerings. Seventy-three percent of foodservice managers were familiar with their district's LWP but did not perceive it changed lunchroom practices. Although LWPs offer a framework to support opportunities for healthy eating, few evidence-based practices were implemented as a direct result of the mandate. Schools need more information about evidence-based practices, as well as technical and financial assistance for implementation.

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**P**ublic schools are an important setting for promoting health behaviors of children and adolescents (1,2). Several school environment and policy features relate to increased healthy food consumption. These include: high availability of fruits and vegetables and low accessibility of high-fat/sugar items (3-7); recess before lunch (8,9); verbal encouragement to choose fruits and vegetables (6); taste tests (10); farm-to-school programs (11); offer vs serve for the school meal program (12); removing sweetened beverages and school stores, and not offering french fries (13); government fruit and vegetable programs; and removing à la carte, vending, snack bar, school store, and dessert items (14).

In response to the childhood obesity epidemic, the US government issued a mandate under the Child Nutrition and Women, Infants, and Children Reauthorization Act of 2004 (15) requiring school districts participating in the National School Lunch Program to create a Local Wellness Policy (LWP) by June 2006. The intent of the LWP was to increase opportunities for healthy eating and physical activity.

The mandate was written in a way that allowed districts to set minimal standards to reach compliance, thus potentially compromising the goal of increasing opportunities for physical activity and healthy eating (16,17). Districts were able to set general rather than specific goals (18) and use weak wording such as *encourage* rather than *require* (19). In addition, there was no funding to support initiatives mentioned in LWPs, nor penalties for inaction.

Colorado researchers were one of the first groups to describe changes in school environment and policy features that occurred after the LWP was implemented (20). Among rural, low-income Colorado elementary schools, opportunities for physical activity did not change after the mandate went into effect. LWPs had weak language in all dimensions and particularly in nutrition guidelines and physical education, indicating that policies did not include strong wording such as *require* or *mandate*.

The present study builds on previous research by investigating changes in low-income, rural Colorado elementary school lunchrooms, classrooms, and other areas of the school building in addition to schoolwide policies related to nutrition. Study goals were to describe changes in evidence-based practices related to healthy food consumption before and after LWP implementation; contents of districts' LWPs related to nutrition, including comprehensiveness and strength of LWP wording; and school foodservice managers' impressions about the impact of the LWP on school cafeteria practices.

## METHODS

### Study Sample

A random sample of 45 (out of 72 eligible) rural Colorado elementary schools in which at least 40% of students received free or reduced-cost lunch was established in fall 2005 to serve as a control group for an intervention study. The random sample comprised 40 school districts (one district had four schools; two districts each had two schools).

### School Environment and Policy Survey

The Rocky Mountain Prevention Research Center created the School Environment and Policy Survey (SEPS) to track environment and policy features related to healthy eating and physical activity (see reference [20] for more information about the tool). Some foodservice items came from the Eat Smart Guidelines section of the Child and Adolescent Trial for Cardiovascular Health (CATCH) foodservice survey (21).

Principals were asked to categorize the presence and enforcement of policies about nutrition content of items sold in schools using the following categories:

1. No policy exists, written or unwritten.
2. There is an unwritten policy that is always or almost always enforced.
3. Written policy exists but is never or almost never enforced.
4. Written policy exists and is sometimes enforced.
5. Written policy exists and is always or almost always enforced.

Response options 2 through 5 were collapsed into a "written or unwritten policy exists" category. Principals,

foodservice managers, and physical education teachers completed the SEPS once in fall 2005, 1 year before the LWP went into effect, and twice after the LWP went into effect: fall 2006 and fall 2007. The baseline survey in fall 2005 was implemented 8 months before the deadline for districts to have a LWP in place, and 6 months after the Colorado legislature passed a bill that encouraged school boards to adopt the LWP.

## Analyses

Analyses were performed using SAS (version 9.2, 2008, SAS Institute Inc, Cary, NC). A *P* value of <0.05 was considered significant. To test for trends with a binary variable, the Generalized Estimating Equations with a binomial distribution, logit link, and compound symmetry correlation structure was used. In the case of a continuous variable, the General Linear Mixed Model with the maximum likelihood estimation method for the covariance parameters and a variance components covariance structure was used. Both types of analyses used a random-effects model that allowed for an unbalanced design; that is, schools with data for either or both years were included, to increase study power. The models for both binomial and continuous variables included a random school effect (eg, number of daily fresh fruit lunch choices=Year 2005 vs Year 2007+random school effect). Because some LWP components may have been implemented the year after the mandate went into effect, the main test of LWP impact was 2005-2006 vs 2007-2008. Additional analyses restricted to schools with data at both time points were conducted to ensure that estimates of trends over time were not biased by the unbalanced design. Although statistical power was reduced, the estimated trends over time were similar and are not presented here.

### Coding LWPs

A tool developed by grantees of the Robert Wood Johnson Foundation Healthy Eating Research Program was used to code LWPs (22). It contained 96 items, organized into seven subsections, including nutrition guidelines for competitive and other foods distributed at school. Two research assistants received training from coding tool creators, independently rated each policy statement (inter-rater agreement 85%), then met to reach 100% agreement on ratings. Contents of the LWP were coded both for comprehensiveness (how many different topic areas the policy covered) and strength (the degree to which the policy language was specific and required action). Each item in a subsection received a score. For example, the nutrition guidelines section contained 29 items, such as "regulates vending machines." This was coded as follows: 0=Not mentioned; 1=Vague, suggested, overridden by principal's discretion, or time specific (eg, "vending machines shall include items which are healthful" or "vending machines shall be unplugged during lunch hour"); and 2=Indicates regulation of all vending machine items or umbrella statement regulating "all foods" or "competitive foods." Comprehensiveness and strength scores for each of the seven subsections can be found elsewhere (see Table 3 in reference [20]).



### Foodservice Manager Key Informant Interviews

Eighteen of the 45 schools were randomly selected to participate in key informant interviews. Thirteen schools agreed to participate and were each compensated \$300. Two researchers conducted interviews with 11 of the 13 foodservice managers between January and May 2008 (in one case the foodservice manager was absent and two assistants were interviewed). Interviews lasted 15 to 30 minutes and focused on foodservice managers' knowledge and familiarity with their district's LWP and how they perceived the LWP had influenced their lunchroom and school environment. The Colorado Multiple Institutional Review Board approved the study protocol, and all foodservice managers provided written informed consent. Interviews were audiotaped and transcribed for analysis. Interviewers used the constant comparison method (23), once individually and once collectively, to discuss and record emerging patterns and themes.

## RESULTS AND DISCUSSION

### School Demographics

Among the 45 schools in the random sample, student enrollment ranged from 28 to 546 (mean 204), students receiving free or reduced lunch rates ranged from 40% to 82% (mean 54.4%); and student body ethnicity ranged from 0% to 72% Hispanic (mean 27%). Survey response rates ranged from 71% to 91% across the 3 years. Specific information about demographics and participation rates are described elsewhere (see Table 1 in reference [20]).

### School Environment and Policy Trends Related to Nutrition

The first set of analyses examined whether evidence-based practices associated with healthy eating changed once the LWP went into effect. These analyses considered policies and practices reported at the school level by principals and foodservice managers but did not take into account the specific content of the LWP.

Table 1 shows trends inside the lunchroom (reported by foodservice managers unless otherwise noted) and outside the lunchroom (reported by principals) before (2005) and after (2007) implementation of LWPs, as measured by the SEPS. Inside the lunchroom, there was an increase in the number of fresh fruits offered daily (0.8 choices in 2005 vs 1.15 choices in 2007;  $P < 0.04$ ). Outside the lunchroom, there was an increase in the percentage of schools stipulating predominantly healthy foods and beverages be offered in classroom parties (21.4% vs 48.7%;  $P < 0.04$ ). There were no changes in daily offerings of vegetables, percent of schools getting produce from local farmers, percent offering candy/high-fat snacks in à la carte, percent offering fruit/vegetables in à la carte, and percent with lunchroom monitors instructed to encourage students to eat their fruits and vegetables. A positive but nonsignificant trend was observed for schools stipulating predominantly healthy foods and beverages in vending machines.

The next set of analyses examined trends in lunchroom food preparation as reported by foodservice managers before and after LWP implementation, as measured by the SEPS. One change was found: More schools reported using skinless poultry (26.67% in 2005 vs 58.82% in 2007;  $P < 0.01$ ).

### Contents of the LWP Nutrition Guideline Subsection

LWPs were obtained from 32 of the 40 school districts. School demographics of the 32 districts did not differ significantly from the eight districts that did not furnish LWPs. The most commonly addressed nutrition guidelines included regulations for vending machines, school stores, and food service à la carte (see Table 2). However, guidelines addressing energy content for foods and/or beverages and limiting the use of unhealthy ingredients were rarely or never addressed. Nutrition guidelines had low strength scores, indicating policies did not include strong words such as *require* or *mandate*. It was more common to see wording like, "It will be encouraged that all foods and beverages available on school grounds meet or exceed District's nutrition standards." Weak words like *encouraged* are not surprising considering the LWP template from the Colorado Association of School Boards contained strong wording for only 19 of 96 items (see Table 3 in reference [20]).

Similar to Utah (24), it was uncommon for districts to mandate a practice not already required by the state (eg, in rural Colorado, only 3% of districts mandated vending guidelines). Even in the case of federally mandated wellness guidelines about foods available on campus, only 51% of rural districts had language that required schools to comply.

### LWP Content and Trends in Nutrition Environment

Eighty-nine percent of rural districts included a statement in their LWP that healthy foods be served at classroom parties. Of those, 47% of schools reported a similar building policy but 53% of schools did not. Thus, there was almost an equal probability of a school having or not having a classroom party policy despite the district's LWP. There was a stronger correspondence between district policies and school practices for items sold in vending machines. Of the 20 schools reporting vending machines, 15 were in districts that included LWP language about nutrition guidelines for items sold.

### Foodservice Managers' Knowledge and Attitudes about LWPs

Eight of the 11 foodservice managers were familiar with their district's LWP. They read it and knew it was either posted on their office wall or filed away. Two of the 11 helped write the policy. None of the foodservice managers believed the LWP influenced their lunchroom practice in regard to the nutritional content of meals, although several mentioned it influenced the food served at classroom parties and the contents of school soda machines. Most foodservice managers attached more importance to the Colorado Department of Education recommendations concerning menu planning, nutrition analysis, reducing fat and salt content, and portion control, which they learned through trainings and workshops. Foodservice managers rarely mentioned receiving Colorado Department of Education training on the LWP, although training was offered.

Five of 11 foodservice managers mentioned lack of financial resources preventing them from providing a broad selection of healthy foods. One FSM said, "We have fresh fruits and vegetables about twice a week;

**Table 1.** Trends in school-level nutrition features in rural, low-income Colorado elementary schools, self-reported by lunchroom managers and principals via the School Environment and Policy Survey

	School Year			P value 2005 vs 2007 <sup>a</sup>
	2005-2006	2006-2007	2007-2008	
<b>Inside the lunchroom</b>				
<b>No. of daily fresh fruit lunch choices</b>				0.04*
n	30	39	34	
Mean±standard deviation	0.80±0.71	0.95±0.76	1.15±0.89	
<b>No. of daily fresh vegetable lunch choices</b>				0.9
n	30	39	34	
Mean±standard deviation	1.27±0.98	1.13±0.98	1.29±1.03	
<b>Schools placing fruits at the front of the lunch line</b>				0.2
n	30	39	33	
%	6.67	12.82	15.15	
<b>Schools placing vegetables at the front of the lunch line</b>				0.3
n	30	39	34	
%	20.00	5.13	8.82	
<b>Schools offering a salad bar some or every day</b>				0.6
n	30	40	35	
%	50.00	42.50	45.71	
<b>No. of minutes for 5th grade lunch<sup>b</sup></b>				0.47
n	31	40	37	
Mean±standard deviation	21.94±6.01	23.15±6.66	23.18±6.25	
<b>Using offer system (vs serve)</b>				0.9
n	27	35	35	
%	59.26	51.43	57.14	
<b>Offering à la carte food items</b>				0.6
n	29	39	34	
%	20.69	15.38	17.65	
<b>Outside the lunchroom vending machines<sup>b</sup></b>				0.4
n	31	40	38	
%	45.2	52.5	52.6	
<b>Of those with vending machines, those that have soda/pop<sup>b</sup></b>				0.3
n	14	21	20	
%	57.14	47.62	45.00	
<b>Of those with vending machines, those that have high-fat/high-energy items<sup>b</sup></b>				0.2
n	14	21	20	
%	50.0	24.0	40.0	
<b>Schools with policies stipulating predominantly healthy foods and beverages be offered in classroom parties<sup>b</sup></b>				0.04*
n	28	39	37	
%	21.4	56.4	48.7	
<b>Schools where lunch recess occurs before lunch<sup>b</sup></b>				0.7
n	31	39	38	
%	22.6	25.6	15.8	

<sup>a</sup>Model includes all observations (eg, 2005 n=30 and 2007 n=34 for fresh fruit choices), but does not include Year 2006 observations.  
<sup>b</sup>Principal provided this information.  
\*P≤0.05.

<sup>a</sup>Model includes all observations (eg, 2005 n=30 and 2007 n=34 for fresh fruit choices), but does not include Year 2006 observations.

<sup>b</sup>Principal provided this information.

\* $P \leq 0.05$ .

the state would want us to have them daily. They keep pushing us to do this but we only have a certain amount of money that only goes so far.” Another FSM remarked that if her budget allowed, she would buy more fruits and vegetables “like apples, oranges, cucumbers, broccoli, and peaches from across the mountain.” Most schools cannot buy fresh fruit and vegetables from local farmers due to health, safety, procurement, and logistical requirements.

Strengths of the What’s Working study included a random sample of rural, low-income Colorado schools and a mixed-methods approach using quantitative and qualitative strategies. Limitations included reliance on self-reported data from foodservice managers and principals, potential for social desirability bias, and study timing—which captured schools in the earliest phase of policy adoption and implementation. Because more resources are now available to help schools advocate for and imple-

**Table 2.** Nutrition regulations and guidelines for competitive and other foods distributed at school included in school districts' Local Wellness Policies, percent of districts addressing the component, percent in which the component is recommended, and percent in which the component is mandated (N=37)

Policy component	Addressing component	Recommend	Mandate
	←————— % —————→		
<b>Federal Wellness Policy Requirement</b>			
Includes nutrition guidelines selected by the local education agency for ALL foods available on each school campus during the school day with the objective of promoting student health and reducing childhood obesity	92	41	51
<b>Policy includes regulations about:</b>			
Vending machines	95	92	3
School stores	95	92	3
Food service à la carte	95	92	3
Food sold and served at class parties and other school celebrations	89	89	0
Food from home for the whole class	84	84	0
Food served before school	87	84	3
Food served after school (beyond district-run afterschool programs)	87	84	3
Food served at evening and community events on school grounds	86	86	0
Food sold for fundraising	68	65	3
<b>Policy includes guidelines about:</b>			
Limiting sugar content of foods	62	59	3
Limiting fat content of foods	62	59	3
Limiting sodium content of foods	5	5	0
Limiting calorie content per serving size of foods	0	0	0
Limiting serving size of foods	68	65	3
Increasing "whole foods": whole grains, unprocessed foods, or fresh produce	43	35	8
Limiting the use of ingredients with questionable health effects in food or beverages (eg, artificial sweeteners, processed or artificial foods, <i>trans</i> fats, high fructose corn syrup)	3	3	0
Food not being used as a reward and/or withheld as a punishment	59	54	5
Nutrition information available for foods other than school meals	22	22	0
Limiting sugar content of beverages	11	8	3
Limiting fat content of drinks (other than milk)	6	3	3
Limiting calorie content per serving size of beverages	0	0	0
Limiting regular (sugar-sweetened) soda	14	11	3
Limiting beverages other than soda containing added energy-containing sweeteners such as sweetened teas, juice drinks, energy drinks, and sports drinks	11	8	3
Limiting sugar/energy content of flavored milk	0	0	0
Limiting fat content of milk	11	8	3
Serving size limits for beverages	3	3	0
Limiting caffeine content of beverages (with the exception of trace amounts of naturally occurring caffeine substances)	8	5	3
Access to free drinking water	68	3	65

ment change (eg, Action for Healthy Kids Wellness Policy Tool), the examination of longer-term effects of the LWP are warranted. Finally, due to the small sample, results may only be generalizable to rural, low-income western areas of the United States.

## CONCLUSIONS

The LWP was intended to increase opportunities for healthy eating and physical activity at a time when one in five US children is obese (25). However, LWPs contained vague, weak language and only a few evidence-based practices have been implemented since it went into effect. Nutrition trainings hosted by the Colorado Department

of Education appear to be a promising strategy for schools to implement evidence-based practices in the lunchroom. However, careful reviews of menus, bigger foodservice budgets, more revenues, and increased ability to purchase local produce are needed to expand healthy offerings. For healthy eating opportunities to increase in other parts of the school building environment, such as foods in classrooms and/or vending machines, administrators need to elevate the importance of nutrition perhaps by being convinced of the link between nutrition and academic achievement. With the exception of school breakfast (26), these links have not yet been established and more research is needed. Finally, because of time con-

straints and competing pressures facing school administrators (20), there is an important role for university partners, the public health workforce, state departments of education, community partner agencies, and funding agencies to play in assisting schools with implementing evidence-based changes aimed at increasing healthy eating opportunities. Ideally, federal mandates such as the LWP would include resources to provide schools with this type of external, expert technical assistance.

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