

**Polk County Agricultural Extension District**

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**Nutrition Environment Measures Survey  
Vending Machines**

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**Introduction**

Chronic health problems, including overweight, obesity, type 2 diabetes, high blood pressure and cardiovascular diseases are increasing in epidemic proportions. These health problems are now afflicting not only adults, but youth as well. Communities need to understand the multiple factors influencing risk for these health problems, one of which is the nutrition environment. The nutrition environment reflects those foods available in the community for consumption. The overarching premise is that individual food consumption is influenced and impacted by the food available in the environment. The food environment includes grocery or convenience stores, restaurants including children's menus. A new venue that has had little attention in the nutrition environment is vending machines. The goal of this grant was to develop an on-line nutrition environment measurement survey tool that can help worksites determine if the vending machines are offering healthy food choices. The survey tool was designed in consultation with Emory University and later the University of Pennsylvania. (The Rollins School of Public Health at Emory University, with a grant from the Robert Wood Johnson Foundation, developed similar tools for grocery/convenience stores and restaurants including children's menus.) Additionally, the Wellmark project provided regional trainings on using the existing Nutrition Environment Measures Survey (NEMS) created by Emory University in addition to the vending survey tool.

**1. List the goals and objectives of the project followed by the progress made toward achieving each goal and objective.**

**Goal # 1--Improve healthy food choices in Iowa by supplying resources and survey instruments.**

**a. Development and testing of a reliable and valid NEMS-like survey instrument for vending machines;**

Development of Nutrition Environment Measures Survey for vending (NEMS-V) tool started in the summer of 2008, with a literature review to determine what research had been completed regarding employee food choices at worksites and the use of vending machines as a food source. A University of Iowa Public Health Graduate Student completed the extensive review that revealed: 1) the use of vending machines in food environment had not been study well, 2) the influence of worksite food choices on employee was a limiting factor in healthy choices of food, and 3) no environmental assessment tool had been developed for vending machines.

Emory University has been a leader in nutrition environment assessment tools and their staff agreed to consult with us on the development of NEMS-V. The consultation included: 1) determining the criteria to use in development of the tool, 2) brainstorming on concept for categorizing foods by color, 3) providing feedback on content of website, and 4) providing teaching materials and support for the five Iowa regional NEMS trainings. In the second year of the grant, Karen Glanz, Ph.D., M.P.H., the principal investigator for the original NEMS tools, moved to the University of Pennsylvania and thus the consultation contract was made with them.

Nutrition standards for the NEMS-V are based on Institute of Medicine (IOM) Nutrition Standards for Foods in Schools. Some standards have been modified to support the Iowa Healthy Kids Act passed in 2008. Other modifications have been made for consumers older than 18.

The food and beverage standards are divided into color codes based on their nutrition profiles.

- RED food and beverages are not as healthy and fall outside the Dietary Guidelines for Americans.
- YELLOW food and beverages are healthy foods that meet the Dietary Guidelines, but do not provide a serving of fruit, vegetable, low-fat dairy or whole grain.
- Food and beverages in the GREEN category are considered the healthiest, are consistent with the Dietary Guidelines for Americans and provide a serving of fruit, vegetable, low-fat dairy or whole grain

An ISU nutrition graduate student worked with the project to pilot the first version of NEMS-V. A CD was created with both a worksite wellness component and the NEMS-V materials. Four worksites participated in focus groups and use of the CD. One of the four sites indicated that their use of the CD led to making improvements in both vending and cafeteria choices. The study did indicate that worksites needed to be ready for change to make the most of the resources provided on the CD. This finding gave support to using a website for dissemination of the NEMS-V tool, as the site would be available when worksites were ready to use them. The website would be easier to update than CDs.

The website development started in summer, 2009. A graphic designer and web designer were contracted to take our vision and create a website.

The Iowa Sports Foundation (ISF), through the 2010 Live Healthy Iowa 100 Day Challenge used grant funds to promote better nutrition at worksites and using the NEMS-V assessment tool in the work place. Ten teams agreed to work with the project and were awarded \$500 each to complete their work.

In May, 2010, with the consultation of University of Pennsylvania NEMS staff, four trained volunteers did reliability testing for the NEMS-V instrument. Both rater-rater (one rater results compared to second rater at same point in time) and inter-rater (one rater compared to another or same rater at one week intervals) reliability were tested. Twenty beverage machines, ten snack vending machines, and six refrigerated machines were used in the study. Reliability data is currently being calculated with the help of the University of Pennsylvania and the Iowans Fit for Life staff.

#### **b. Development of community report card template.**

A Worksite Vending Report Card was created as a feature on the NEMS-V web site ([www.nems-v.com](http://www.nems-v.com)). This customized report indicates how many additional yellow or green choices need to be added to each machine in order to earn various recognition levels for that particular machine and for the site as a whole. The report also includes a checklist for actions to take to improve the vending environment and eventually implement a vending policy.

The recognition levels include Bronze (30% of choices are yellow or green); Silver (40% are yellow or green); Gold (50% are yellow or green and no red foods are advertised). The Bronze recognition level of 30% is in line with Automatic Merchandiser State of the Vending Industry Report (2008) advising operators to fill only about 20-30% of each vending machine's slots with healthier choices in order to maintain profits.

#### **Goal #2-- Measure the improved food environment in Iowa businesses, schools, and communities by using the online reporting mechanism.**

##### **a. Development of an online reporting mechanism**

The website development started in summer, 2009. A graphic designer and web designer were contracted to take our vision and create a website. After discussion the website was created with the following pages: why vending; vending machine resources; vendor communication; promotional ideas; success stories; literature review; worksite wellness resources; frequently asked questions; contact information; a NEMS-V healthy choices calculator; vending assessment tool and supporting resources; and a vending report card.

A completed NEMS-V assessment will:

- Provide a visual depiction of each vending machine showing green-, yellow-, or red-coded foods and beverages based on Institute of Medicine (IOM) Nutrition Standards for Foods in Schools with modifications from Iowa's Healthy Kids Act

- Provide an award certificate for each machine and the location as a whole
- Generate a report card for each machine and location as a whole

**b. Conduct five regional trainings for expanded use of NEMS survey instruments including vending machine.**

April, 2010, five regional workshops were held in Iowa to train professionals on the use of all NEMS tools including NEMS-V. Two-day workshops were held in Cherokee, Mason City, Iowa City, Atlantic and Altoona. A total of 55 attended the workshops and represented County Public Health, ISU Extension, private companies (Pella). The evaluations indicated that:

- "Received assessment tools that we will actually be able to use in the real world."
- "Content interesting. I'm anxious to use in local community."
- "Vending scoring tool-great resource that I plan to use across our clientele worksites."
- "Learning to look at restaurants, stores, and vending machines in a new and healthy way"
- "Content relevant to the work we are doing in Public Health."
- "Learning a new method to analyze the environment. This workshop allowed me to think of many new ways to analyze the data as well as potential projects for my worksite."

At the conclusion of the workshops, participants were invited to submit a mini-grant proposal to use the NEMS tools in their community in the next six weeks. The mini-grants were for \$500.

**c. Development of recognition system for businesses, schools, and communities choosing to adopt NEMS recommendations.**

The teams for the ISF project were recognized for their participation and completion of the project at the May, 2010, ISF annual Sport Leadership meeting. An additional outcome in having the businesses attend this meeting for the recognition was that they also participated in the planning for the 2011 Iowa Challenge which will make it more business friendly.

The NEMS-V web site provides an ongoing recognition system for business, schools, and communities by providing an award certificate for each vending machine and the location as a whole and by generating a report card for each machine and location as a whole.

**2. What difference did this grant make in your community and for the population you are serving? Please provide specific outcome results and/or data to support your impact.**

The outcomes of the participating ISF businesses include:

- 50% created a business food treat policy during the Challenge
- 70% provided at least one healthy food choice at all company events during the project
- 70% provided increased access to water
- 70% evaluated availability of microwave/refrigerator for staff to bring lunch
- 30% provided healthy choices daily at company cafeteria (not all had on-site cafeteria)
- 80% ask staff to eliminate candy dishes on desks
- 60% provided a healthy food promotion including focus on vending machines
- 70% completed the NEMS-V assessment tool and two worked with their vendor to provide healthy choices in the vending machine.

Awareness about healthier choices in the vending machine was certainly an outcome. ISF will use funds left as incentives for businesses completing a survey regarding helping businesses to create a better nutrition environment at their worksite.

See APPENDIX A for a listing of the outcomes resulting from the mini grants provided to NEMS-trained recipients and a graph depicting where NEMS assessments have occurred.

**3. What unanticipated results, positive or negative, did you encounter? If external or environmental factors negatively affected your results, how did you address these issues?**

a. Deciding to consult with Emory University for the development of the project was a good idea in that it provided recognition at the national level and provided a path for the tools to be used at the national Built Environment Assessment Training (BEAT) Institute trainings (<http://www.med.upenn.edu/beat/>).

b. Originally, we projected we would have 125 people attend one of the five regional workshops; we had 55 participants. Many people indicated that if the workshop was just one day long, they could attend but two days was more time than they had. We knew that conducting the training to use all NEMS tools including the new NEMS-V would be difficult to do even in a two day time frame. Our optimistic view of this is that if people had two days to devote to the training, they were ready to use the tools. Our goal was to have the tools used and not stored away in a notebook. Additionally, offering a \$500 incentive to participants insured that the tools would be used immediately. This plan was a winner!

**4. Describe what you learned from this project. What programmatic or organizational changes are being considered based on these lessons?**

a. Food in a vending machine is placed so that the Nutrition Facts Label is virtually unavailable for a person before purchase. In order to evaluate the nutrition of the food item we needed to use a 'calculator' to determine the nutrition quality of a food project. The calculator needed to be easy to use and fit the criteria we had selected for categorizing the vending machines. Our searches of the internet and other sources revealed there was not a calculator already developed that met our needs so we began development of the Healthy Choices Calculator (<http://nems-v.com/NEMS-VHealthyChoicesCalc.html>). While this feature was not included in our original plan, we believed it may be one of the features that will be used extensively. Jennifer DeWalt, IDPH community consultant worked with this aspect of the project and reports she used 160 hours of time.

b. Our original plan called for gathering data on availability of vending machines in worksites and working with small businesses to learn how they used the vending in their food environment. It was difficult to find and work with such groups and we were only able to identify four groups instead of the projected six. We were able to use the remaining funds as mini-grants following the April regional trainings to encourage participants to use the tools immediately. Having NEMS-trained mini grant recipients use the NEMS-V tools and web site helped us to find mistakes, computer glitches, and unclear directions so that changes could be made to make the materials more useful.

c. The mini-grant process used following the regional trainings was key to having groups adopt the NEMS tools including the NEMS-V tool. Following the five trainings, participants were given an opportunity to apply for small grants (\$500) to use any of the tools in a small project in their community within six weeks. The application was very simple and open to wide uses in a community. Our NEMS project worked with the Iowans Fit for Life Worksite group to provide a total of 24 grants. All but one of the applications completed their project in the time allowed. Key to this process was 1) easy application process and 2) only offering the mini-grants to participants completing the two-day training. This insured that we had committed applicants.

d. Selecting personnel to work with a project is key to success. We admit that luck played a part in some of this. Our web programmer gave us invaluable insight because of his work history. He is currently a web-training staff member for a major insurance company and had worked for several years for a large grocery store chain in Iowa. Not only was he a good programmer but he was also understood what we were trying to accomplish. Our graphic designer was equally qualified as she had worked for many years with nutrition programming at ISU Extension.

Graduate students from both ISU and the University of Iowa added strength to our process. In 2008, our first student created our literature review, a key to knowing where we needed to start in development. ISU students helped in developing the early web page as well as testing the NEMS-V tools for easy use.

**5. In what ways do you plan to share the results of this project? How might The Wellmark Foundation assist in promoting replication of your project to other communities?**

1. We have many groups interested in the completion of the NEMS-V tool. Our plan to promote the use of the tools includes:

- National Beat Institute- include as on-going training
- ISU Extension and National Extension connections
- IDPH media outlets including a feature article in the Des Moines Register
- Iowans Fit For Life Partnership
- CDC-DNPO report-Success Stories to Reduce Energy Dense Foods
- CDC website

There is discussion of providing a CDC webinar (live and archived) in Fall,2010 to introduce others to the NEMS-V tools

**6. Describe your plans for sustaining or expanding this program including funding sources.**

a. NEMS-V was included in the Iowans Fit for Life community action plan. By completing this project, we were able to assist in the carrying out of this statewide plan.

b. The two-day regional trainings as well as the trained ISU Extension nutrition staff have given us a wide spread group of people trained to use all of the tools for assessment throughout the state. This core group is committed to using the tool to engineer a change in our nutrition environment.

c. The Affordable Care Act passed earlier this year included an amendment requiring restaurants and vending machine suppliers having more than 20 locations to provide calorie information that consumers can easily read. Senator Tom Harkin sponsored the amendment. We believed the NEMS-V especially the Healthy Choices calculator will be beneficial to consumers and vendors alike. We have some enhancements in mind for the vending website that would include a print out displaying calories in addition to whether a food or beverage is considered a green, yellow or red food category. We hope to contact Senator Harkin to discuss ways to promote the website along with the regulations for the amendment, once they are written.