MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES

DIVISION OF COMMUNITY AND PUBLIC HEALTH

COMMODITY SUPPLEMENTAL FOOD PROGRAM

FOOD PROGRAM SURVEY 2004 - 2005

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SUMMARY

The Missouri Commodity Supplemental Food Program (CSFP) supports nutritional well-being by providing supplemental foods, especially those rich in vitamins A and C, calcium and iron to eligible women, children and the elderly. The Missouri Department of Health and Senior Services (DHSS) coordinates the ordering process, food banks receive and package the commodities and local organizations determine eligibility of participants, distribute the food packages and provide nutrition education. A survey was conducted to evaluate the current effectiveness of the CSFP program nutrition education and determine the needs of program customers. The survey was conducted in two geographical areas, St. Louis and southeast Missouri, known as the Bootheel. The surveys were completed beginning in November 2004 through early 2005. Thirty-four food distribution sites (i.e., four in the Bootheel and 30 in St. Louis) were randomly selected to participate in this evaluation project.

Returned surveys were from respondents in their mid-70s (Table 1) and 75 percent were female (Table 2). African Americans represented the majority of St. Louis participants (80 percent), while whites were the majority (86 percent) in the Bootheel (Table 3). St. Louis participants tended to be about two years older on average than the Bootheel participants. Both groups averaged a body mass index of 29 (Table 23), which is considered at the upper end of the "overweight" category but not yet "obese" by the Centers for Disease Control and Prevention (CDC) criteria (Hedley, Ogden et al. 2004).

The nutrition education section of the survey found more participants in the St. Louis area responded more positively about wanting to know more about nutrition. However, the majority (80 percent) of both groups reported they liked the handouts being received in the commodity food boxes and would like more information on food preparation (Tables 4, 5). Neither group wanted to attend a nutrition class (Table 6).

Most (90 percent) CSFP participants agreed that a good diet would keep them healthy (Table 18), most (79 percent) knew the recommended number of servings of fruits and vegetables a day was five (Table 19), and over 80 percent knew that two servings of meat or protein were necessary each day (Table 20). Regardless of this knowledge of the need to eat five servings of fruits and vegetables a day, only 3-6 percent of those surveyed did consume the recommended five servings (Table 21). Over half ate one to two servings, while almost a third consumed three to four servings of fruits and vegetables a day (Table 21). Fresh fruits and vegetables were more available in the St. Louis area throughout the year for 55 percent of respondents, than in the Bootheel area where only 28 percent of respondents could obtain fresh fruits and vegetables throughout the year (Table 15).

A small but significant percentage of respondents (10-16 percent) reported physical environment limitations including lack of running water, lack of electricity and limited cooking equipment (Tables 11,

12, 13). The most frequent limitation (30%) referenced by participants was limited refrigerator space (Table 14). Food insecurity questions revealed approximately 40 percent of CSFP recipients were worried about having enough money to buy food (Table 16). In addition, one out of four individuals reported cutting the size of meals or skipping meals due to lack of money in the last 12 months, with Bootheel participants being the most acutely affected (Table 17).

BACKGROUND

The Missouri Commodity Supplemental Food Program (CSFP) supports nutritional health by providing a variety of supplemental foods such as infant formula, cereals, non-fat and evaporated milk, juice, rice, pasta, dry beans, peanut butter, etc. These foods are rich in vitamins A and C, calcium and iron. Program participants are women who are pregnant, breastfeeding and postpartum women up to 12 months, children, 0 to 5 years of age; and the elderly, aged 60 and over. The Missouri Department of Health and Senior Services (DHSS) coordinates the ordering process and contracts with food banks to receive and package the commodities. Local organizations determine eligibility of participants, distribute the food packages and provide nutrition education. This survey was conducted to evaluate the current effectiveness of the CSFP program nutrition education and determine the needs of program customers.

This survey (Appendix 1) provides a means of participant input and a source of process data regarding nutrition knowledge, food security, and other limitations and barriers experienced by participants. This information will assist the program to tailor its activities to meet participants' needs. In addition to federal regulations requiring evaluation of nutrition education efforts, the National CSFP Board of Directors recently requested more demographic and chronic-disease related information for the seniors in the program. Projected losses of donated food commodities, as well as justification for future funding for the CSFP have stimulated additional social and economic indicators that might be considered in future statewide Missouri surveys.

MANDATE

At the time this survey was conducted the goals of nutrition education for the CSFP set forth by the U.S. Department of Agriculture (sec. 247.8) were to:

(1) emphasize the relationship of proper nutrition to the total concept of good health, with special emphasis on the nutritional needs of pregnant, postpartum, and breastfeeding women, infants and children under 6 years of age; and

(2) assist participants in obtaining a positive change in food habits, resulting in improved nutritional status and in the prevention of nutrition related problems through maximum use of the supplemental and other nutritious foods.

The federal regulation 247.5(a)(5) stated the nutrition education portion of the CSFP State Plan shall include an evaluation component that includes a systematic procedure for participants' input. The CSFP nutrition education was also charged with assuring the education was within the context of ethnic, cultural and geographic preferences and consideration be given to tailoring nutrition education to meet any limitations experienced by groups of participants, such as lack of running water, electricity, and limited cooking or refrigeration facilities (247.8(b)(2)).

This survey represents the first systematic process to assess client needs and effectiveness of nutrition education provided as part of mandated supplemental food program requirements. Findings from this survey will be informative and assist in program planning for CSFP.

METHODOLOGY

The surveys were administered to program participants at a representative sample of 34 randomly chosen distribution sites from the total 114 possible sites. The sample sites were chosen from a master list of all distribution sites using a random number table. Two food banks supplied the food packages for the 34 distribution sites. Sampling was limited to the St. Louis and southeast Missouri "Bootheel" areas. The St. Louis food bank distributed 4,500 and the Bootheel food bank distributed 2,500 packages per month during the survey period, for a combined total of 7,000 individuals being served in the two areas.

Questionnaire constructs were derived from the Harvard Women's Nutrition Questionnaires with other items such as fruit and vegetable consumption and weight from questionnaires such as the Behavioral Risk Factor Surveillance System (BRFSS) and Youth Risk Behavior Survey (YTS). The Missouri Department of Health and Senior Services (DHSS) staff developed surveys included participants' perceptions of handouts they currently receive with their food boxes, what types of information or classes they would like, any environmental limitations such as water, electricity, as well as food security, nutrition knowledge, and fruit/vegetable consumption on a 5-point Likert interval scale.

The program administrator was instructed to offer assistance to any participants having difficulty reading or completing the self-administered questionnaire forms and to note on refused questionnaires basic demographic information, apparent gender and ethnicity based on visual assessment. This information on refusals was collected in order to describe those individuals who refuse to participate in order to re-frame questions and procedures to include as many people as possible.

The instrument, evaluated at a fifth grade reading level, was to be administered to all participants at four sites located in the Bootheel and 30 sites in the St. Louis area, for a total of 1,950 participants (Bootheel n = 593 and St. Louis n = 1,357), or 27.9 percent of the total 7,000 participants in these two areas.

Standard nonparametric descriptive analyses appropriate for interval data including Chi-Square and Mann-Whitney or Wilcoxin tests for differences between regions, sites and/or ethnic groups were conducted via Statistical Package for Social Sciences (SPSS).

RESULTS

Of the 34 sites randomly selected, 22 participated from the St. Louis area and 4 from the Bootheel area, for an 86.6 percent site participation rate. All clients within each site were surveyed to reduce selection bias, with approximately 9 to 116 clients per site responding for a total of 1,035 surveys returned. A description of the demographics and results of knowledge and attitudes towards nutrition education follow.

DEMOGRAPHICS

AGE

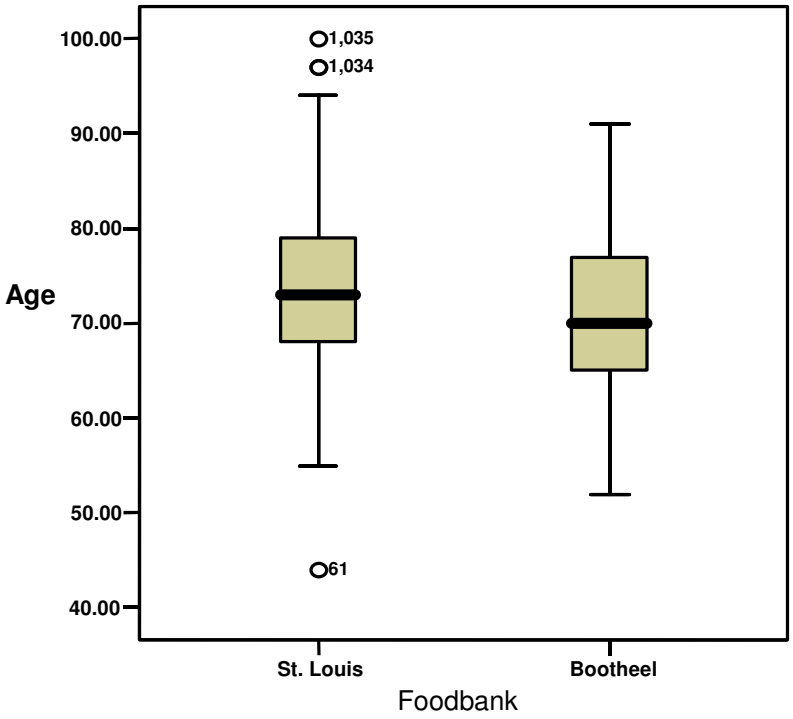
The St. Louis area population was slightly older by two years than the Bootheel participants. This difference was statistically significant ($p < 0.0001$), however, both were within the senior age range; therefore, the two year difference was not considered to create a practical difference between the two groups.

Table 1. Age of CSFP Survey Participants in the St. Louis and Bootheel Food Banks

	Food bank	N	Mean	Std. Deviation	Std. Error Mean	Significance (2-tailed)
Age	St. Louis	677	73.5037	7.95561	.30576	t=3.7
	Bootheel	293	71.4266	8.06006	.47087	P< 0.0001
	Missing	65				

A slightly older population for the St. Louis area can be seen in Figure 1. Two individuals in their late 90s were seen as outliers within the St. Louis population (case numbers 1034 and 1035), which may have weighted the average older in the St. Louis group than in the Bootheel group. There is also a young outlier in the St. Louis area.

Figure 1. Box plot of Age of CSFP Survey Participants in the St. Louis and Bootheel Food Banks



SEX

As can be seen in Table 2, the CSFP population was primarily (75 percent) female and approximately 25 percent male. These proportions hold for both areas and are not statistically different according to Chi-square.

Table 2: Sex of CSFP Survey Participants in St. Louis and Bootheel Food banks

			Food bank		Total
			St. Louis	Bootheel	
Sex	MALE	Count	177	71	248
		% within Food bank	25.2%	24.5%	25.0%
	FEMALE	Count	526	219	745
		% within Food bank	74.8%	75.5%	75.0%
Total		Count	703	290	993
		% within Food bank	100.0%	100.0%	100.0%

RACE/ETHNICITY

The racial/ethnic groups found for St. Louis and the Bootheel CSFP survey populations are shown in Table 3. A previous estimate of 80 percent African American in the St. Louis Food Bank was close to this survey that also found 80.5 percent participants to be African American within the St. Louis Food Bank population. Similarly, a finding of 86.5 percent White participants in the Bootheel Food Bank paralleled a previous estimate of 82.6 percent of White population in the Bootheel Food Bank.

Numbers of senior Hispanic participants are less than 1 percent in St. Louis in this survey. This survey detected a larger number of Hispanics in the Bootheel, close to 2.4 percent; however, both numbers are possibly underestimates for the state as a whole. This under-representation may be an artifact of utilizing only the Eastern portion of food banks in Missouri.

The differences in racial/ethnic composition between the predominantly White Bootheel Food Bank and the predominately Black St. Louis Food Bank (Table 3) are consistent differences which are statistically significant by Chi-square = 431, $p < 0.0001$.

Table 3: Race/Ethnicity Cross tabulation for CSFP Survey Participants in St. Louis and Bootheel Food Banks

Race/Ethnicity			Food bank		Total
			St. Louis	Bootheel	
	American Indian	Count	3	5	8
		Expected Count	5.6	2.4	8.0
		% within respondents	.4%	1.7%	.8%
	Asian	Count	2	0	2
		Expected Count	1.4	.6	2.0
		% within respondents	.3%	.0%	.2%
	Black	Count	554	27	581
		Expected Count	409.6	171.4	581.0
		% within respondents	80.5%	9.4%	59.5%
	White	Count	125	249	374
		Expected Count	263.6	110.4	374.0
		% within respondents	18.2%	86.5%	38.3%
	Hispanic	Count	4	7	11
		Expected Count	7.8	3.2	11.0
		% within respondents	.6%	2.4%	1.1%
Total		Count	688	288	976
		Expected Count	688.0	288.0	976.0
		% within respondents	100.0%	100.0%	100.0%

NEED FOR NUTRITION KNOWLEDGE QUESTIONS

The need for nutrition knowledge consists of four questions: 1, 2, 6, and 19 from the Questionnaire:

1. Q. 1. I would like to know more about good nutrition and healthy eating.
2. Q. 2. I need to know how to prepare the food in my monthly food box.
3. Q. 6. I would attend a class on nutrition or cooking.
4. Q.19. Would you like to receive other information with your food boxes?

Differences were found between the two food banks on what types of nutrition education they believe they need. Tables 4- 7 below give frequency of responses from strongly agree to strongly disagree for the above four questions by each food bank**.**

Table 4. Cross tabulation and Rank Tests for Question 1: Need to know more about good nutrition and healthy eating.

Knowmore			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	246	86	332
		Expected Count	235.9	96.1	332.0
		% within Food bank	35.1%	30.2%	33.7%
	agree	Count	306	123	429
		Expected Count	304.9	124.1	429.0
		% within Food bank	43.7%	43.2%	43.6%
	neutral	Count	90	48	138
		Expected Count	98.1	39.9	138.0
		% within Food bank	12.9%	16.8%	14.0%
	disagree	Count	45	21	66
		Expected Count	46.9	19.1	66.0
		% within Food bank	6.4%	7.4%	6.7%
	strongly disagree	Count	13	7	20
		Expected Count	14.2	5.8	20.0
		% within Food bank	1.9%	2.5%	2.0%
Total		Count	700	285	985
		Expected Count	700.0	285.0	985.0
		% within Food bank	100.0%	100.0%	100.0%

Ranks	Food bank	N	Mean Rank	Sum of Ranks
Know more	St. Louis	700	482.47	337730.00
	Bootheel	285	518.86	147875.00
	Total	985		

Statistical Tests	Know more
Mann-Whitney U	92380.000
Wilcoxin W	337730.000
Z	-1.945
Sig. (2-tailed)	.052

More participants in the St. Louis Food Bank answered that they needed to know more about nutrition and healthy eating than the Bootheel p = 0.052. According to mean ranking of the responses, the Bootheel participants were less likely to say they need to know more about nutrition.

Table 5. Cross tabulation and Rank Tests for Question 2: I need to know how to prepare the food in my monthly food box.

Prepare			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	112	35	147
		% within Food bank	16.6%	12.6%	15.4%
	agree	Count	163	79	242
		% within Food bank	24.1%	28.5%	25.4%
	neutral	Count	134	78	212
		% within Food bank	19.9%	28.2%	22.3%
	disagree	Count	202	61	263
		% within Food bank	29.9%	22.0%	27.6%
	strongly disagree	Count	64	24	88
		% within Food bank	9.5%	8.7%	9.2%
Total		Count	675	277	952
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Foodbank	N	Mean Rank	Sum of Ranks
Prepare	St. Louis	675	480.98	324660.50
	Bootheel	277	465.59	128967.50
	Total	952		

Test Statistics	Prepare
Mann-Whitney U	90464.500
Wilcoxin W	128967.500
Z	-.806
Sig. (2-tailed)	.420

There were no statistical differences between food banks for the need to know how to prepare food in the boxes. On average, 15 percent of both groups strongly agreed and 25 percent agreed that they did need to know how to prepare the food in the boxes, which outnumbered the neutral responses (22 percent) or negative responses that totaled 27.6 percent for “disagree” and 9.2 percent for “strongly disagree”.

Table 6. Cross tabulation and Rank Tests for Question 6: I would attend a class on nutrition or cooking

Class			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	75	22	97
		% within Food bank	11.5%	7.8%	10.4%
	agree	Count	112	41	153
		% within Food bank	17.1%	14.5%	16.3%
	neutral	Count	144	44	188
		% within Food bank	22.0%	15.5%	20.1%
	disagree	Count	181	93	274
		% within Food bank	27.7%	32.9%	29.2%
	strongly disagree	Count	142	83	225
		% within Food bank	21.7%	29.3%	24.0%
Total		Count	654	283	937
		% within Food bank	100.0%	100.0%	100.0%

Ranks	Food bank	N	Mean Rank	Sum of Ranks
Class	St. Louis	654	449.67	294086.50
	Bootheel	283	513.66	145366.50
	Total	937		

Test Statistics	class
Mann-Whitney U	79901.500
Wilcoxin W	294086.500
Z	-3.414
Sig. (2-tailed)	.001

Over 53 percent of both St. Louis and Bootheel groups indicated they definitely would not like a nutrition class as compared to 27 percent who would like a nutrition class and 20 percent who were neutral. Bootheel Food Bank participants felt significantly more strongly about not attending a class on nutrition than St. Louis Food Bank participants, ($p < 0.001$), but despite this difference in how strongly they declined to attend a class on nutrition, neither group wanted to attend a class in nutrition.

Table 7. Frequency Distribution for Question 19: Would you like to receive other information with your food boxes?

Question 19.	Frequency	Percent
Blank	355	34.3
yes	269	26.0
no	411	39.7
Total	1035	100.0

A minority of twenty-six percent of respondents wanted to receive other information with their food boxes. Of those commenting, less than 5 wanted recipes, but most responded that they liked getting information in the food boxes. Most answered, "yes, I agree" to the question asking whether they would like other information in their boxes, indicating this question was not read well and was perhaps confusing to participants. In the future, the program may want to consider more specific options for materials and information that could be commented on.

ASSESSMENT OF HANDOUTS

CSFP participants answered a 5-part Likert scale regarding readability and usefulness of the handouts they currently receive. The scale ranged from "Strongly Agree" to "Strongly Disagree" with "smiley faces" graphically portraying affect toward the question.

1. Q. 3. The handouts I receive with my monthly food boxes are easy to read and understand.
2. Q. 4. The handouts I receive with my monthly food boxes help me eat right.
3. Q. 5. The handouts I receive with my monthly food boxes help me use all the food provided

Table 8. Q. 3. The handouts I receive with my monthly food boxes are easy to read and understand.

Handout1			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	286	95	381
		% within Food bank	41.8%	32.4%	39.0%
	agree	Count	321	162	483
		% within Food bank	46.9%	55.3%	49.4%
	neutral	Count	64	24	88
		% within Food bank	9.3%	8.2%	9.0%
	disagree	Count	13	6	19
		% within Food bank	1.9%	2.0%	1.9%
	strongly disagree	Count	1	6	7
		% within Food bank	.1%	2.0%	.7%
Total		Count	685	293	978
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Handout1	St. Louis	685	476.25	326234.00
	Bootheel	293	520.47	152497.00
	Total	978		

	handout1
Mann-Whitney U	91279.000
Wilcoxin W	326234.000
Z	-2.477
Sig. (2-tailed)	.013

Table 8, a cross tabulation of readability and ease of understanding of handouts, shows that the Bootheel participants found the handouts more difficult than the St. Louis participants ($p = 0.013$), however, overall almost half of both groups strongly agreed that the handouts were readable and easy to understand.

Table 9. Q. 4. The handouts I receive with my monthly food boxes help me eat right.

Handout2			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	245	85	330
		% within Food bank	35.8%	29.0%	33.8%
	agree	Count	328	161	489
		% within Food bank	48.0%	54.9%	50.1%
	neutral	Count	83	33	116
		% within Food bank	12.1%	11.3%	11.9%
	disagree	Count	19	9	28
		% within Food bank	2.8%	3.1%	2.9%
	strongly disagree	Count	9	5	14
		% within Food bank	1.3%	1.7%	1.4%
Total		Count	684	293	977
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Handout2	St. Louis	684	480.64	328755.00
	Bootheel	293	508.53	148998.00
	Total	977		

	handout2
Mann-Whitney	94485.000
Wilcoxin W	328755.000
Z	-1.550
Sig. (2-tailed)	.121

When participants were asked whether or not the handouts help the participants “eat right” (Table 9), over half of both groups indicated that the handouts did contribute to their food choices, and no differences between the two groups were found.

Table 10. Q. 5. The handouts I receive with my monthly food boxes help me use all the food provided.

Handout3			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	243	89	332
		% within Food bank	36.1%	30.4%	34.3%
	agree	Count	298	169	467
		% within Food bank	44.2%	57.7%	48.3%
	neutral	Count	103	24	127
		% within Food bank	15.3%	8.2%	13.1%
	disagree	Count	24	8	32
		% within Food bank	3.6%	2.7%	3.3%
	strongly disagree	Count	6	3	9
		% within Food bank	.9%	1.0%	.9%
Total		Count	674	293	967
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Handout3	St. Louis	674	484.29	326414.50
	Bootheel	293	483.32	141613.50
	Total	967		

	Handout3
Mann-Whitney	98542.50
Wilcoxin W	141613.500
Z	-.054
Sig. (2-tailed)	.957

Over 80 percent of respondents either agreed strongly or agreed that the handouts helped them use all of the food provided in the packages. The Bootheel respondents seemed to respond more positively toward the statement than the St. Louis group. There were more 'neutral" responses from the St. Louis residents (15.3 percent) versus the Bootheel residents (8.2 percent).

PHYSICAL LIMITATIONS AFFECTING FOOD PREPARATION

Several questions surveyed the ability of participants to prepare food items with regard to physical limitations and food availability. The 5-part Likert scale was a continuation of the previous matrix of questions with smiley faces representing "Strongly Agree" to "Strongly Disagree" for the following statements. The questions on the questionnaire are numbers 7-10 and 13:

1. Q. 7. I have problems with lack of running water.
2. Q. 8. I have problems with lack of electricity.
3. Q. 9. I have limited cooking equipment.
4. Q. 10. I have limited refrigerator space.
5. Q. 13. I can buy fresh fruits and vegetables any time of the year.

No differences were found between St. Louis and Bootheel food bank participants in Tables 11-13 below for running water, electricity or cooking equipment. Approximately 11 percent reported difficulties with running water (Table 11); 12 percent had problems with lack of electricity (Table 12); and 14 percent reported limited cooking equipment to be a problem (Table 13).

One third of all participants (14 percent + 15.7 percent) in both groups reported limited refrigerator space to be a limitation for their food preparation activities (Table 14). Refrigeration space was statistically more of a problem ($p < 0.007$) for the St. Louis Food Bank than the Bootheel Foot Bank participants.

Table 11: Q. 7. I have problems with lack of running water.

Lack of running water			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	**49**	**13**	**62**
		% within Food bank	7.3%	4.7%	6.5%
	agree	Count	16	22	38
		% within Food bank	2.4%	7.9%	4.0%
	neutral	Count	39	13	52
		% within Food bank	5.8%	4.7%	5.5%
	disagree	Count	267	97	364
		% within Food bank	39.7%	34.9%	38.3%
	strongly disagree	Count	301	133	434
		% within Food bank	44.8%	47.8%	45.7%
Total		Count	672	278	950
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Lack of running water	St. Louis	672	473.03	317876.00
	Bootheel	278	481.47	133849.00
	Total	950		

	Lack of running water
Mann-Whitney	91748.000
Wilcoxin W	317876.000
Z	-.469
Sig. (2-tailed)	.639

Table 12: Q. 8. I have problems with lack of electricity.

Lack of electricity			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	48	13	61
		% within Food bank	7.1%	4.7%	6.4%
	agree	Count	22	24	46
		% within Food bank	3.3%	8.6%	4.8%
	neutral	Count	33	13	46
		% within Food bank	4.9%	4.7%	4.8%
	disagree	Count	268	92	360
		% within Food bank	39.9%	33.0%	37.9%
	strongly disagree	Count	301	137	438
		% within Food bank	44.8%	49.1%	46.1%
Total		Count	672	279	951
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Lack of electricity	St. Louis	672	472.49	317514.00
	Bootheel	279	484.45	135162.00
	Total	951		

	Lack of electricity
Mann-Whitney	91386.000
Wilcoxin W	317514.000
Z	-.664
Sig. (2-tailed)	.507

Table 13: Q. 9. I have limited cooking equipment.

Limited cooking equipment			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	50	13	63
		% within Food bank	7.3%	4.7%	6.6%
	agree	Count	42	28	70
		% within Food bank	6.2%	10.1%	7.3%
	neutral	Count	56	20	76
		% within Food bank	8.2%	7.2%	7.9%
	disagree	Count	274	92	366
		% within Food bank	40.2%	33.1%	38.1%
	strongly disagree	Count	260	125	385
		% within Food bank	38.1%	45.0%	40.1%
Total		Count	682	278	960
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Limited cooking equipment	St. Louis	682	472.97	322566.00
	Bootheel	278	498.97	138714.00
	Total	960		

	Limited cooking equipment
Mann-Whitney	89663.0
Wilcoxin W	322566.000
Z	-1.406
Sig. (2-tailed)	.160

Table 14: Q. 10. I have limited refrigerator space.

Limited refrigerator space			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	114	20	134
		% within Food bank	16.8%	7.2%	14.0%
	agree	Count	99	51	150
		% within Food bank	14.6%	18.4%	15.7%
	neutral	Count	81	32	113
		% within Food bank	11.9%	11.6%	11.8%
	disagree	Count	242	99	341
		% within Food bank	35.6%	35.7%	35.6%
	strongly disagree	Count	144	75	219
		% within Food bank	21.2%	27.1%	22.9%
Total		Count	680	277	957
		% within Food bank	100.0%	100.0%	100.0%

	Food bank	N	Mean Rank	Sum of Ranks
Limited refrigerator space	St. Louis	680	464.15	315624.50
	Bootheel	277	515.45	142778.50
	Total	957		

Test Statistics	Limited refrigerator space
Mann-Whitney U	84084.500
Wilcoxin	315624.500
Z	-2.693
Sig. (2-tailed)	.007

One third of all participants (14 percent + 15.7 percent) in both groups reported limited refrigerator space as a limitation for their food preparation activities (Table 14). Refrigeration space was statistically more of a problem ($p < 0.007$) for the St. Louis Food Bank than the Bootheel Foot Bank participants.

Table 15: Q. 13. I can buy fresh fruits and vegetables any time of the year.

Buy Fresh Veggies			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	118	28	146
		% within Food bank	17.3%	9.9%	15.2%
	agree	Count	257	51	308
		% within Food bank	37.7%	18.1%	32.0%
	neutral	Count	131	64	195
		% within Food bank	19.2%	22.7%	20.2%
	disagree	Count	134	104	238
		% within Food bank	19.7%	36.9%	24.7%
	strongly disagree	Count	41	35	76
		% within Food bank	6.0%	12.4%	7.9%
Total		Count	681	282	963
		% within Food bank	100.0%	100.0%	100.0%

Ranks	Food bank	N	Mean Rank	Sum of Ranks
Buy fresh veggies	St. Louis	681	439.26	299138.00
	Bootheel	282	585.21	165028.00
	Total	963		

Test Statistics	Buy fresh veggies
Mann-Whitney U	66917.000
Wilcoxin W	299138.000
Z	-7.643
Sig. (2-tailed)	.000

Over half (55 percent) of St. Louis Food Bank participants reported that they were able to buy fresh fruits and vegetables any time of year, where only 28 percent of Bootheel participants reported the ability to buy fresh fruits and vegetables year-round. Statistics in Table 15 show this difference to be statistically significant ($p < 0.0001$).

FOOD SECURITY/INSECURITY

Food security questions were derived from the Harvard Women's Health Study and focused on whether or not the participants worried about having enough money to buy food in the last 12 months, and whether or not they had skipped meals or cut down on the size of meals due to lack of funds. The 5-part Likert scale was a continuation of the previous matrix of questions with smiley faces representing "Strongly Agree" to "Strongly Disagree" for the statements. The questions on the questionnaire are 11 and 12 are addressed in Table 16 and 17:

1. Q. 11. In the last 12 months I have worried about having enough money to buy food.
2. Q. 12. In the last 12 months I cut the size of meals or skipped meals due to lack of money for food.

Table 16: Q. 11. In the last 12 months I have worried about having enough money to buy food.

Worry about money			Food bank		Total
			St. Louis	Bootheel	
	strongly agree	Count	96	45	141
		% within Food bank	14.4%	16.0%	14.9%
	agree	Count	159	79	238
		% within Food bank	23.9%	28.1%	25.1%
	neutral	Count	116	72	188
		% within Food bank	17.4%	25.6%	19.9%
	disagree	Count	196	57	253
		% within Food bank	29.4%	20.3%	26.7%
	strongly disagree	Count	99	28	127
		% within Food bank	14.9%	10.0%	13.4%
Total		Count	666	281	947
		% within Food bank	100.0%	100.0%	100.0%

Ranks

Food bank		N	Mean Rank	Sum of Ranks
Worry about money	St. Louis	666	490.54	326701.50
	Bootheel	281	434.79	122176.50
	Total	947		

	Worry about money
Mann-Whitney	82555.500
Wilcoxin W	122176.500
Z	-2.937
Sig. (2-tailed)	.003

Approximately forty percent of both the St. Louis and Bootheel Food Bank participants either agreed or strongly agreed that they had worried about having enough money to buy food in the past twelve months. Table 16 shows this difficulty expressed significantly more strongly for the Bootheel participants than the St. Louis residents ($p < 0.003$).

Table 17: Q. 12. In the last 12 months I cut the size of meals or skipped meals due to lack of money.

Cut Back On Meals			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	53	25	78
		% within Food bank	7.9%	9.1%	8.2%
	agree	Count	96	57	153
		% within Food bank	14.2%	20.7%	16.1%
	neutral	Count	115	66	181
		% within Food bank	17.0%	24.0%	19.1%
	disagree	Count	276	79	355
		% within Food bank	40.9%	28.7%	37.4%
	strongly disagree	Count	135	48	183
		% within Food bank	20.0%	17.5%	19.3%
Total		Count	675	275	950
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Cut back on meals	St. Louis	675	493.05	332808.50
	Bootheel	275	432.42	118916.50
	Total	950		

	Cut back on meals
Mann-Whitney	80966.500
Wilcoxin W	118916.500
Z	-3.204
Sig. (2-tailed)	.001

Both groups report 1 out of 4 individuals have cut the size of meals or skipped meals due to lack of money in the last 12 months (Table 17). There were significantly more residents in the Bootheel area than in the St. Louis area who agreed with this statement ($p < 0.001$).

NUTRITION KNOWLEDGE/BEHAVIOR

Several questions surveyed the nutrition knowledge of participants as well as number of servings of fruits and vegetables they eat in a day. The 5-part Likert scale was a continuation of the previous matrix of questions with smiley faces representing "Strongly Agree" to "Strongly Disagree" for the statements. The questions on the questionnaire 14-17:

1. Q. 14. Eating a good diet can help keep me healthy.
2. Q. 15. For good health I should eat at least 5 servings of vegetables and fruits every day.
3. Q. 16. For good health I should eat at least 2-3 servings of meat or protein every day.
4. Q. 17. Check the number of servings of vegetables and fruits you eat each day:

Table 18: Q. 14. Eating a good diet can help keep me healthy.

Good Diet			**Food bank**		**Total**
			St. Louis	**Bootheel**	
	strongly agree	Count	302	102	404
		% within Food bank	44.2%	35.7%	41.7%
	agree	Count	315	149	464
		% within Food bank	46.1%	52.1%	47.9%
	neutral	Count	51	23	74
		% within Food bank	7.5%	8.0%	7.6%
	disagree	Count	11	8	19
		% within Food bank	1.6%	2.8%	2.0%
	strongly disagree	Count	4	4	8
		% within Food bank	.6%	1.4%	.8%
Total		Count	683	286	969
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	**N**	**Mean Rank**	**Sum of Ranks**
Good diet	St. Louis	683	471.69	322167.00
	Bootheel	286	516.78	147798.00
	Total	969		

	Good Diet
Mann-Whitney U	88581.00
Wilcoxin W	322167.000
Z	-2.530
Sig. (2-tailed)	.011

The great majority, almost 90 percent of both groups, agreed (47.9) or strongly agreed (41.7) with the statement that a good diet would keep them healthy (Table 18). There were more disagreements with this statement in the Bootheel (2.8 percent disagree; 1.4 percent strongly disagree) than in St. Louis (1.6 percent disagree, 0.6 percent strongly disagree). These differences were significant statistically to the p = 0.011 level.

Table 19: Q. 15. For good health I should eat at least 5 servings of vegetables and fruits every day.

5 Fruits and Vegetable Servings			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	237	90	327
		% within Food bank	34.4%	31.6%	33.6%
	agree	Count	304	139	443
		% within Food bank	44.1%	48.8%	45.5%
	neutral	Count	106	36	142
		% within Food bank	15.4%	12.6%	14.6%
	disagree	Count	35	12	47
		% within Food bank	5.1%	4.2%	4.8%
	strongly disagree	Count	7	8	15
		% within Food bank	1.0%	2.8%	1.5%
Total		Count	689	285	974
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
5 fruit vegetable servings	St. Louis	689	485.47	334492.00
	Bootheel	285	492.40	140333.00
	Total	974		

	5 fvserving
Mann-Whitney U	96787.000
Wilcoxin W	334492.000
Z	-.376
Sig. (2-tailed)	.707

Both groups were knowledgeable about the number of recommended servings of fruits and vegetables that are required. A total of 79 percent of respondents in both St. Louis and Bootheel Food Banks acknowledged that 5 servings of fruits and vegetables were necessary for good health. Both groups were equally knowledgeable, as there was no statistical difference between the two.

Table 20: Q. 16. For good health I should eat at least 2-3 servings of meat or protein every day.

2-3 Meat Servings or Protein for Good Health			Food bank		
			St. Louis	Bootheel	Total
	strongly agree	Count	222	80	302
		% within Food bank	32.6%	28.2%	31.3%
	agree	Count	347	157	504
		% within Food bank	51.0%	55.3%	52.2%
	neutral	Count	79	30	109
		% within Food bank	11.6%	10.6%	11.3%
	disagree	Count	29	10	39
		% within Food bank	4.3%	3.5%	4.0%
	strongly disagree	Count	4	7	11
		% within Food bank	.6%	2.5%	1.1%
Total		Count	681	284	965
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
2 meat protein servings	St. Louis	681	477.27	325018.50
	Bootheel	284	496.75	141076.50
	Total	965		

	2 mp servings
Mann-Whitney U	92797.500
Wilcoxin W	325018.500
Z	-1.089
Sig. (2-tailed)	.276

Respondents in both Bootheel and St. Louis Food Banks strongly agreed (31.3 percent) or agreed (52.2 percent) that two servings of meat or protein were recommended each day for good health. Both areas scored essentially the same and were in agreement over 80 percent of the time that two servings of meat or protein were necessary each day.

Table 21: Q. 17. Check the number of servings of vegetables and fruits you eat each day.

Number			Food bank		Total
			St. Louis	Bootheel	
	1-2	Count	344	139	483
		% within Food bank	51.0%	48.1%	50.1%
	3-4	Count	224	107	331
		% within Food bank	33.2%	37.0%	34.3%
	5+	Count	40	10	50
		% within Food bank	5.9%	3.5%	5.2%
	None	Count	16	4	20
		% within Food bank	2.4%	1.4%	2.1%
	don't know	Count	51	29	80
		% within Food bank	7.6%	10.0%	8.3%
Total		Count	675	289	964
		% within Food bank	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Sig. (2-sided)
Pearson Chi-Square	6.020 (a)	4	.198
Likelihood Ratio	6.226	4	.183
Linear-by-Linear Association	.512	1	.474
N of Valid Cases	964		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.00.

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Number fv	St. Louis	675	479.03	323345.50
	Bootheel	289	490.60	141784.50
	Total	964		

	Number fv
Mann-Whitney U	95195.5
Wilcoxin W	323345.5
Z	-.648
Sig. (2-tailed)	.517

Approximately half of program respondents reported eating 1-2 servings of fruits and vegetables a day, while almost a third consume 3-4 servings of fruits and vegetables a day, and 3-6 percent consume the recommended 5 servings of fruits and vegetables a day. The average intake of fruits and vegetables was the same for both groups, with neither significantly different from the other.

ANTHROPOMETRY

Anthropometry was assessed by self-reported categorization of weight from underweight to very overweight in question 18. Body mass index (wt/ht^2) was calculated from self-report weight and height as part of question 18:

1. Q. 18. How do you describe your weight?
2. Current BMI calculated from Q. 18 weight/height.

Table 22: Q. 18. How do you describe your weight?

Wt description			Food bank		Total
			St. Louis	Bootheel	
	very underweight	Count	26	13	39
		% within Food bank	4.1%	4.8%	4.3%
	slightly underweight	Count	82	27	109
		% within Food bank	12.8%	9.9%	12.0%
	about right weight	Count	282	94	376
		% within Food bank	44.1%	34.6%	41.3%
	slightly overweight	Count	195	114	309
		% within Food bank	30.5%	41.9%	33.9%
	very overweight	Count	54	24	78
		% within Food bank	8.5%	8.8%	8.6%
Total		Count	639	272	911
		% within Food bank	100.0%	100.0%	100.0%

Ranks

	Food bank	N	Mean Rank	Sum of Ranks
Wt description	St. Louis	639	442.32	282641.00
	Bootheel	272	488.14	132775.00
	Total	911		

	Wt description
Mann-Whitney U	78161.000
Wilcoxin W	282641.000
Z	-2.552
Sig. (2-tailed)	.011

More participants report “underweight” or that they are “about right” from the St. Louis Food Bank region than from the Bootheel (Table 22). Overall, less than 5 percent considered themselves “very underweight” and another 12 percent “slightly underweight”. Ten percent more St. Louis respondents (44 percent) considered themselves “about right” as opposed to 34.6 percent of the Bootheel participants. Overall the differences in perception of weight was significant p = 0.011.

Table 23: Current BMI calculated from Q. 18 weight/height.

Group Statistics

	Food bank	N	Mean	Std. Deviation	Std. Error Mean
BMI	St. Louis	555	29.1574	7.07543	.30034
	Bootheel	239	28.6973	6.03492	.39037

Case Summary

Food bank		Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
BMI	**St. Louis**	555	76.1%	174	23.9%	729	100.0%
	Bootheel	239	79.9%	60	20.1%	299	100.0%

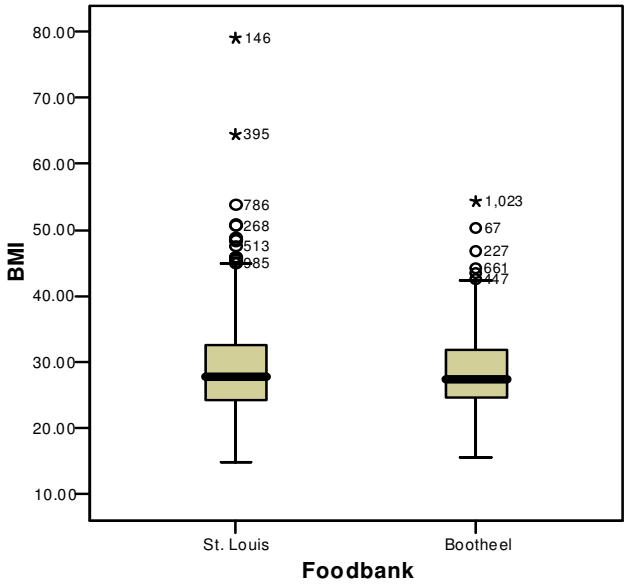
Independent Samples Test

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
BMI	.877	792	.381	.46011	.52452	-.56951	1.48974

The average Body Mass Index (BMI) for both the St. Louis respondents (29.157) and for the Bootheel respondents (28.697) can be rounded to 29. Despite the different opinions participants have of their weight in Table 22, namely more people from the Bootheel believing they were overweight and more people from St. Louis believing they were underweight, the two groups actually were the same weight for height. When actual BMI was calculated by the formula weight/height^2, the two groups, Bootheel and St. Louis were essentially the same.

Figure 2 is a graphical depiction of the BMI measurements and, with the exception of some upper outliers, shows the two groups have essentially the same BMI measurements.

Figure 2. Box Plots of Average BMI for St. Louis and Bootheel Food Bank Survey Participants.



Weight and height are self-reported.

CONCLUSIONS AND RECOMMENDATIONS

The Likert Scale "smiley faces" format seemed well understood and generated a sizable response rate of 85 percent. The methodology, forms, data base, and analysis utilized for this study should be easily repeatable for further survey of the remainder of the state, namely Southwest, Central Missouri and the Kansas City and Northwest areas when needed.

Neither group wanted nutrition classes, but seemed well disposed toward handouts in their boxes. From their responses, it seems that handouts to be distributed in their boxes giving simple instructions for food preparation that did not require refrigeration or extra utensils would be most useful.

Review of the 270 comments, or 25 percent of the 1,035 surveys, revealed an overall acceptance and appreciation of the program. Specific comments and recommendations by the program participants included:

- "Not enough food" – 4
- "More fresh fruits or vegetables" – 7
- "Would like oatmeal in box" – 2
- "More noodles" – 1
- "Less dairy" – 3
- "More dairy" – 1
- "Don't like no-fat cheese" – 1
- "Less starch, no white sugar" – 1

The overwhelming appreciation of the program was most clearly expressed with 96 percent positive comments such as "wonderful", "great program", very good" and "thank you" entered for 260 of the 270 comments.

Reference:

Hedley, A. A., C. L. Ogden, et al. (2004). "Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002." JAMA **291**(23): 2847-50.

Food Program Survey

We are using this survey to improve the Missouri Commodity Supplemental Food Program. Your answers will be kept strictly confidential and will not affect your benefits.

Age: _____ **Sex**: ☐1 Male ☐2 Female **Zip Code (Home address)**: __ __ __ __ __

Ethnicity: ☐1 Hispanic or Latino ☐2 Not Hispanic or Latino

Race: (Please mark one or more)

☐1 American Indian or Alaska Native ☐2 Asian ☐3 Black or African American

☐4 Native Hawaiian or Other Pacific Islander ☐5 White

Please check mark the column that indicates how you feel about the items below.

	Strongly Agree1 	Agree2 	Neutral3 	Disagree4 	Strongly Disagree5 
1. I would like to know more about good nutrition and healthy eating.					
2. I need to know how to prepare the food in my monthly food box.					
3. The handouts I receive with my monthly food boxes are easy to read and understand.					
4. The handouts I receive with my monthly food boxes help me eat right.					
5. The handouts I receive with my monthly food boxes help me use all the food provided.					
6. I would attend a class on nutrition or cooking.					
7. I have problems with lack of running water.					
8. I have problems with lack of electricity.					
9. I have limited cooking equipment.					

PLEASE TURN OVER

Please check mark the column that indicates how you feel about the items below.

	Strongly Agree$_1$ 	Agree$_2$ 	Neutral$_3$ 	Disagree$_4$ 	Strongly Disagree$_5$ 
10. I have limited refrigerator space.					
11. In the last 12 months I have worried about having enough money to buy food.					
12. In the last 12 months I cut the size of meals or skipped meals due to lack of money for food.					
13. I can buy fresh fruits and vegetables any time of the year.					
14. Eating a good diet can help keep me healthy.					
15. For good health I should eat at least 5 servings of vegetables and fruits every day.					
16. For good health I should eat at least 2-3 servings of meat or protein every day.					

17. Check the number of servings of vegetables and fruits you eat each day.
- ☐$_1$ 1-2
- ☐$_2$ 3-4
- ☐$_3$ 5 +
- ☐$_3$ 0
- ☐$_3$ Don't Know/Unsure

18. How do you describe your weight?

Current weight: _____

Current Height: _____

- ☐$_1$ Very underweight
- ☐$_2$ Slightly underweight
- ☐$_3$ About the right weight
- ☐$_4$ Slightly overweight
- ☐$_5$ Very overweight

19. Would you like to receive other information with your food boxes?

20. Do you have comments or concerns about the program in general?

THANKS FOR YOUR HELP