

## **OBESITY AND FOOD INSECURITY – IS THERE A RELATIONSHIP?**

**A research summary compiled by Kadi Row and Amy Rettammel**  
**August 2003**

Prevalence rates are increasing for both food insecurity and obesity. The two issues continue to attract a great deal of attention from policy makers, health professionals, educators, advocates and the media. Discussions revolve around why the problems exist, who is at risk, and what should be done.

Questions are now being raised about the co-existence of obesity and food insecurity: Can someone be both obese and food insecure? The research in this area is still quite new, though studies are beginning to help us understand the relationship. Specific research studies have found the relationship to vary by population. For example, a positive relationship between food insecurity and obesity has been found in women and older non-Hispanic white girls; an inverse relationship has been found young girls and 5<sup>th</sup> grade Hispanic children; and a lack of any relationship has been found in men, and low-income Mexican American preschoolers. There is no consensus as to why this relationship exists or does not exist, but researchers have proposed some possible explanations which will be outlined at the end of this paper.

First by way of background, we know that both food insecurity and obesity are problems in and of themselves in Wisconsin. 8.4% of Wisconsin households are food insecure, and 2.9% experience hunger -- a more extreme form of food insecurity. The prevalence of food insecurity is on the rise both in Wisconsin and nationally. Wisconsin households at greatest risk are poor (31% of poor households are food insecure), headed by a single mother (33%); or African American (30%).

In Wisconsin, as nationally, the prevalence of obesity continues to rise. In 2001, 22% of Wisconsin adults were obese (up from 13% in 1991) and 10% of Wisconsin high-school-age youth were overweight. For Wisconsin children younger than high-school age, the only available data are from low-income children under age 5 participating in the WIC program. In 2001, these data indicate that 11% of low-income 2 to 4-year-old Wisconsin children were overweight (up from 9% in 1994). National statistics allow for comparison of obesity rates by income level. These data indicate that low-income women are 50% more likely to be obese than women with higher incomes, regardless of race or ethnicity. Non-Hispanic white adolescents are also more likely to be overweight if they are from low-income households than if they are from households with higher incomes.

### **DOES A RELATIONSHIP EXIST BETWEEN FOOD INSECURITY AND OBESITY?**

In short, the results are mixed. From the research available to date it appears that the answer depends on what population is studied. In one recent study, Adams, et. al, found that food insecure California women are more likely to be obese than those that are food secure<sup>1</sup>, and that the risk is greatest in non-White women. That is, race/ethnicity determined the level of risk: food insecure non-Hispanic White women were 36% more likely to be obese than their food secure counterparts, and food insecure women of other races/ethnicities were 150 to 280% more

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<sup>1</sup> Adams, Elizabeth J. et al. 2003. J. Food Insecurity Is Associated with Increased Risk of Obesity in California Women. *The Journal of Nutrition*. 133:1070-1074

likely to be obese than their counterparts. Researchers controlled for income, education, and general health status, among other things. Interestingly, the authors found that “the effect of food insecurity with and without hunger remained significant, even after controlling for poverty status.”

Townsend and colleagues<sup>2</sup> examined the relationship between food insecurity and overweight status in US adults. Results showed a relationship between food security status and overweight status in women, but not in men. The finding of a positive relationship among women depended on the severity of food insecurity: Women with mild or moderate food insecurity levels were more likely to be overweight. The prevalence of overweight was lower for both food secure women and severely food insecure women.

Alaimo and colleagues<sup>3</sup> found that of all US children, an “increased prevalence of overweight and food insufficiency occurs only in older low-income non-Hispanic white children.”

Finally, a study of women in rural upstate NY households<sup>4</sup> found body mass index (BMI) to be significantly higher for women in food insecure households as compared to those in food secure households. In this study, 37% of women from food insecure households were classified as obese, compared to 26% in food secure households. “Food insecurity was related to adiposity [obesity], after controlling for income, education, single parenthood, and employment.”

In contrast, in attempting to discern the effects of participation in nutrition assistance programs on obesity, Jones and colleagues<sup>5</sup> found that in a sample of children from low-income households, “the overall prevalence of child risk of overweight was 40.7% in food secure households and 34.2% in food insecure households.”

There are also cases where no relationship between obesity and food insecurity was found. As noted by the Townsend study, such a relationship was not found among men. Likewise, a study designed to describe the relationship between food insecurity to nutrition of low-income Mexican-American preschoolers found no significant differences in weight or height status of children by level of food insecurity<sup>6</sup>. Alaimo and others did not find an increased prevalence of overweight and food insufficiency in young non-Hispanic white children, non-Hispanic black children or Mexican American children. And finally an analysis by Casey, et. al.<sup>7</sup> looking at 1994 and 1996 data from the Continuing Survey of Food Intakes by Individuals, “did not show that food insufficiency by itself is associated with self-reported measures of obesity in children.”

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<sup>2</sup> Townsend, M. S., et. al. 2001. Food Insecurity Is Positively Related to Overweight in Women. *Journal of Nutrition*, 131: 1738-1745.

<sup>3</sup> Alaimo, K., et. al. 2001. Low Family Income and Food Insufficiency in Relation to Overweight in US Children: Is There a Paradox? *Archives of Pediatrics and Adolescent Medicine*. 155(10):1161-1167.

<sup>4</sup> Frongillo, E. A., et. al. 1997. Nutritional consequences of food insecurity in a rural New York State county. University of Wisconsin-Madison, Institute for Research on Poverty. Discussion paper 1120-97.

<sup>5</sup> Jones, S. A., et. al. 2003. Lower Risk of Overweight in School-aged Food Insecure Girls Who Participate in Food Assistance. *Archives of Pediatrics and Adolescent Medicine*. 157:780-784.

<sup>6</sup> Kaiser, L. L., et. al. 2002. Food security and nutritional outcomes of preschool-age Mexican American children. *Journal of the American Dietetic Association*. 102(7):924-929.

<sup>7</sup> Casey, P. H. 2001. Children in Food-Insufficient, Low-Income Families: Prevalence, Health, and Nutrition Status. *Archives of Pediatrics and Adolescent Medicine*. 155(4):508-514.

## **WHAT DO WE KNOW ABOUT THE ‘WHY’?**

There are no specific studies that pinpoint why obesity and food insecurity can co-exist in households or individuals. Possible explanations offered by the researchers cited above include the following.

### **A fluctuating food supply**

Townsend et. al. suggest that one explanation for this relationship is the fluctuation in resources for food. “Overeating by food-insecure families when palatable food is plentiful, i.e., when food stamps or money for food is available, followed by a short period of involuntary food restriction, followed by overeating, could be a pattern that results in gradual weight gain over time.”

In a case study, Dietz<sup>8</sup> suggests that “obesity may represent an adaptive response to episodic food insufficiency.”

Yet, in discussing their own research, Matheson and others<sup>9</sup> report that “the lower BMI’s in the food-insecure children may have been due to short-term, yet periodic food restrictions that resulted as household food supplies diminished before payday.”

### **Disordered eating**

Frongillo (1997) and colleagues state that “Given that low socioeconomic status and, specifically, food insecurity lead to uncertainty in people’s lives, disordered eating is one possible mechanism to explain why those with lower socioeconomic status are more prone to be overweight. Pointing to other research, Adams and colleagues suggest that food insecurity “may be associated with disordered eating and a poor diet, potentially increasing the risk for obesity and health problems”.

Adams et. al. summarize that there is “strong evidence from populations of dieters, prisoners of war and children with food-restrictive parents that food deprivation may lead to over consumption of previously restricted foods after the restriction ends.”

In summarizing other research, Alaimo and colleagues state that “periods without enough food could cause individuals to overeat when there is enough food, resulting in increased energy intake overall, which would then cause a gain in weight,” and that “fluctuations in eating habits could result in the body becoming a more efficient user of energy, meaning that the individual could increase in weight without eating more calories.”

### **The cost of food**

Sarlio-Lahteenkorva and colleagues<sup>10</sup> speculate that since “healthy diets tend to cost more than energy-dense food,” “this may influence dietary intake and eating patterns.”

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<sup>8</sup> Dietz, W.H. 1995. Does hunger cause obesity? *Pediatrics*. 95(5):766-767.

<sup>9</sup> Matheson, D.M. et. al. 2002. Household food security and nutritional status of Hispanic children in the fifth grade. *American Journal of Clinical Nutrition*. 76:210-217.

<sup>10</sup> Sarlio-Lähteenkorva, S. and E. Lahtela. 2001. Food Insecurity Is Associated with Past and Present Economic Disadvantage and Body Mass Index. *Journal of Nutrition*. 131:2880-2884.

Adams et. al. suggest that “food insecurity may limit the variety of foods available and result in consumption of high energy, low cost foods.”

Alaimo, et. al. suggest that “food-secure individuals may be overweight because they can only afford to consume cheaper foods, which tend to be energy (calorie) dense and could result in the person consuming excessive energy and gaining weight.”

On the other hand, a USDA report<sup>11</sup> summarizing survey data on dietary intake among Food Stamp participants and other low-income individuals found that “mean nutrient intake levels of energy, vitamins and minerals for low-income adults are significantly lower than those for high-income adults.”

### **Stress as a linking factor**

In a recent commentary, Frongillo<sup>12</sup> considers stress a link between food insecurity and obesity. “Food insecurity is a stressor, i.e., it leads to stress. Stress has broad effects, and is linked specifically to eating behaviors and obesity.”

## **IMPLICATIONS FOR EXTENSION EDUCATORS**

The studies included in this summary have identified a positive relationship between food insecurity and obesity in some populations (women, non-Hispanic white adolescents) and not in others (men, younger children). While the research to date may help confirm what appears on the surface to be a paradox, the fact that the findings vary so much by population suggests that simple conclusions cannot be drawn about the reasons behind this apparent relationship. Further research is needed to determine why food insecurity and obesity seem to coexist.

While that research is being conducted, it remains important to connect people with resources so that they can adequately, safely, and nutritiously feed themselves and their families. In addition, education about resource management can help individuals and families have enough money for food. Education about making informed food choices and preparing nutritious meals and snacks helps individuals and families use the food they have.

Extension educators are compassionate resources in their communities. This is an important strength that applies to addressing both the problem of food insecurity and the epidemic of obesity, regardless of the relationship between the two.

### **For Further Reading**

If you are interested in a list of research articles related to this topic, please contact Kadi Row (kadi.row@uwex.edu, 608-265-2934).

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<sup>11</sup> Gleason, Rangarajan, and Olson. Dietary Intake and Dietary Attitudes Among Food Stamp Participants and Other Low-Income Individuals. September 2000. A report submitted to USDA by Mathematica Policy Research, Inc. Accessed 8/26/03 from <http://www.fns.usda.gov/oane/MENU/Published/NutritionEducation/NutEd.htm>

<sup>12</sup> Frongillo, E. A. 2003. Understanding Obesity and Program Participation in the Context of Poverty and Food Insecurity. *Journal of Nutrition*. 133: 2117-2118.