

FOOD INSECURITY AND SOLUTIONS

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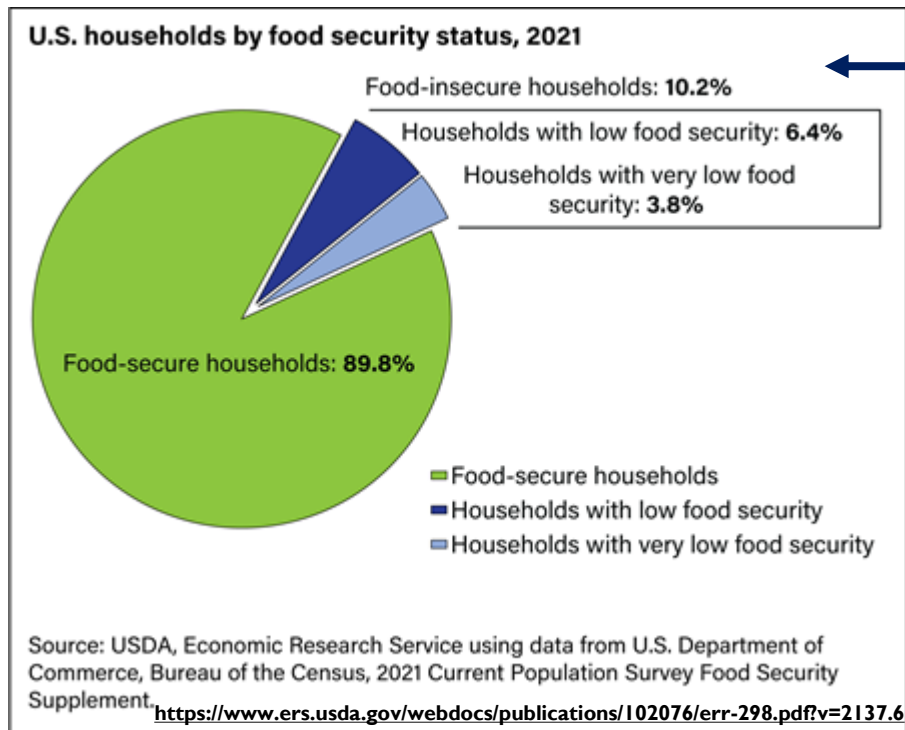
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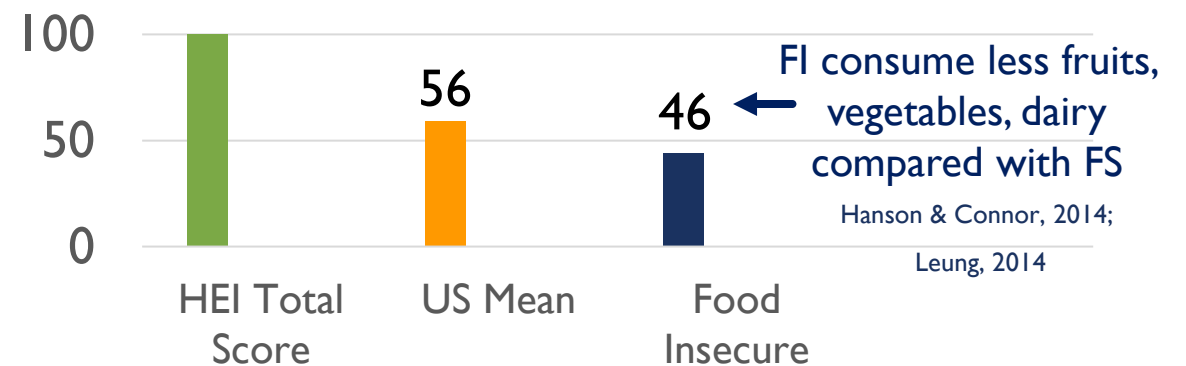
FOOD INSECURITY IS AN INDICATOR OF NUTRITIONAL RISK

- Food Insecurity: “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable food in socially acceptable ways” Anderson et al, 1990
- Measured by US Household Food Security Survey Module, 18 item, self-reported



← Healthy
People 2030
Goal = 6%

Quality of diet compared with the Dietary Guidelines for Americans



FOOD INSECURITY LINKED WITH NOT MEETING AVERAGE NUTRIENT REQUIREMENTS

- The proportion not meeting EARs is greater for several nutrients compared with food secure groups
- A prior review has shown that vitamins A, B6, calcium, magnesium and zinc are linked to food insecurity Hanson & Connor, 2014
- But nutrient gaps may vary by many varying characteristics, location, and other factors

Table 2. Proportion of the population falling below the Estimated Average Requirement or above the Adequate Intake from total usual nutrient intakes of select nutrients, by food security status, among adults (≥ 19 years) in the U.S., 2011–2014. ^{1,2}

	Food Security Status, % < EAR/> AI (SE)	
	Food Insecure	Food Secure
Men (n, %)	(915, 14.9%)	(3993, 85.1%)
Calcium (mg)	25.0 (2.2)	20.0 (1.3)
Iron (mg) ³	0.3 (0.2)	0.1 (0.1)
Magnesium (mg)	57.2 (1.7) ^a	43.9 (1.5) ^b
Potassium (mg) ⁴	25.0 (2.5) ^a	37.0 (1.6) ^b
Zinc (mg)	20.1 (2.4) ^a	11.3 (1.1) ^b
Choline (mg) ⁴	12.6 (2.3)	11.8 (1.1)
Folate (DFE, μ g) ⁵	7.0 (1.8)	4.0 (0.7)
Vitamin B6 (mg)	6.1 (1.3) ^a	1.4 (0.4) ^b
Vitamin C (mg)	49.0 (3.8) ^a	37.0 (1.7) ^b
Vitamin D (μ g)	79.2 (1.5) ^a	64.1 (1.2) ^b
Women (n, %)	(1010, 15.6%)	(4034, 84.4%)
Calcium (mg)	46.0 (3.0)	40.0 (1.3)
Iron (mg) ³	—	—
Magnesium (mg)	56.9 (2.6) ^a	40.9 (1.4) ^b
Potassium (mg) ⁴	24.0 (3.1) ^a	35.0 (1.7) ^b
Zinc (mg)	17.1 (2.8)	12.2 (1.3)
Choline (mg) ⁴	4.4 (1.5)	3.5 (0.6)
Folate (DFE, μ g) ⁵	15.0 (3.5)	11.0 (1.3)
Vitamin B6 (mg)	19.0 (1.6) ^a	8.8 (0.9) ^b
Vitamin C (mg)	42.0 (2.4) ^a	29.0 (1.3) ^b
Vitamin D (μ g)	74.7 (1.7) ^a	56.2 (1.2) ^b

Abbreviations: EAR, Estimated Average Requirement; AI, Adequate Intake; SE, standard error. ¹ The analytic sample includes individuals ≥ 19 years old that were not pregnant/lactating with complete information for the day 1 and 2, 24 h dietary recalls. ² Different superscript letters denote a significant difference between food security categories at a p -value < 0.005 . ³ Proportion of the population below the EAR for iron was unable to be assessed using the cut-point method in women due to a skewed distribution of nutrient requirements. ⁴ Indicates %> AI rather than %< EAR. This occurs when sufficient scientific evidence is not available to establish an EAR. ⁵ As dietary folate equivalents (DFEs). 1 DFE = 1 μ g food folate = 0.6 μ g of folic acid from fortified food or as a consumed with food = 0.5 μ g of a supplement taken on an empty stomach.

FOOD INSECURITY LINKED TO POOR HEALTH

Food Insecurity



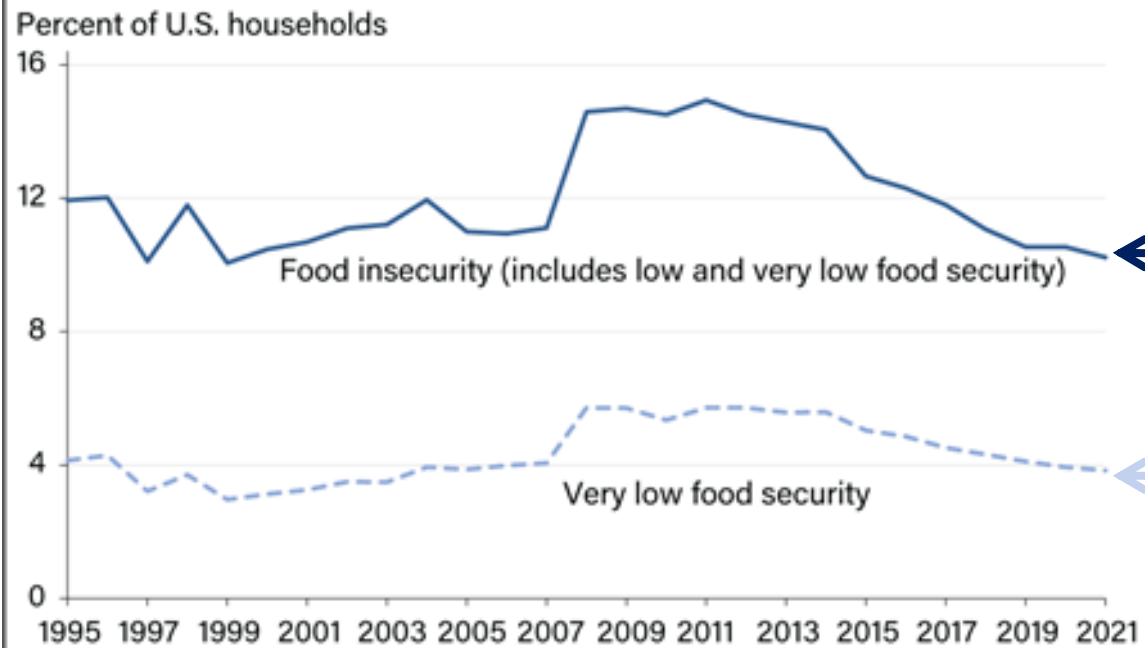
Health Outcomes: poor or fair health, - physical function, +chronic disease, +inflammation, +cancer, +cardiovascular and heart disease, +diabetes, Poorer glycemic control, less adherence to blood glucose monitoring, more related ER visits, lower self-efficacy for diabetes management, +hypertension, +abnormal serum triglycerides, total cholesterol, low and high density lipoprotein, elevated serum cholesterol

¹Siefert et al, 2001, Pheley et al, 2002, Tarasuk, 2003, Stuff et al, 2004, Vozoris & Walker et al, 2007, Sharkey et al, 2011, Ramsey et al, 2012. ²Klesges et al, 2001, Lee & Frongillo 2001, Siefert et al, 2001, Stuff et al, 2004. ³Vozoris & Tarasuk 2003, Holben & Pheley 2006, Seligman et al, 2007, Seligman et al, 2010. ⁴Gowda et al., 2012. ⁵Vozoris and Tarasuk 2003, Holben and Pheley 2006, Seligman et al., 2007, Seligman et al., 2010, Galesloot et al., 2012.

⁶Gucciardi et al., 2009, Seligman et al., 2012. ⁷Vozoris and Tarasuk 2003, Tayie and Zizza 2009, Seligman et al., 2010a. ⁸Vozoris and Tarasuk 2003. NCEP 2002. Tayie and Zizza 2009, Dixon et al., 2001.

FOOD INSECURITY PERSISTS AMONG THE POPULATION

Trends in prevalence rates of food insecurity and very low food security in U.S. households, 1995-2021



Note: Prevalence rates for 1996 and 1997 were adjusted for the estimated effects of differences in data collection screening protocols used in those years.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census, Current Population Survey Food Security Supplements.

FI has not gone below about 10%

Relatively less change 3.9%

We did NOT see FI increase after COVID, likely due to SNAP increases

- Improving food security for all demands focusing on difficult-to-reach groups
 - highest prevalence
 - Very low food insecurity
 - Most severe potential effects

FOOD INSECURITY, A FOCUS ON SOLUTIONS

EXAMPLE 1:
EMERGENCY FOOD ASSISTANCE

EXAMPLE 2:
NUTRITION EDUCATION

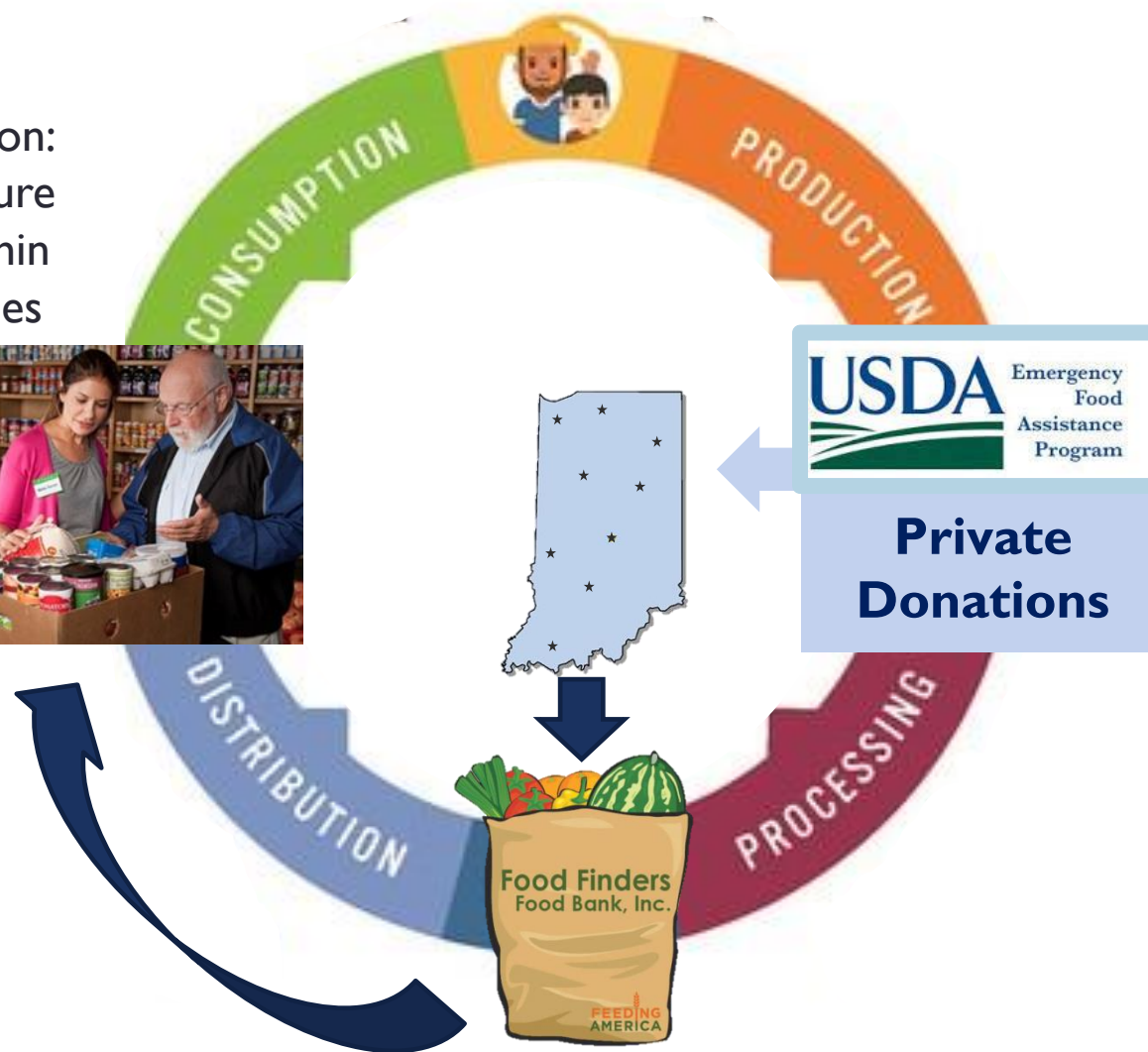


Kristin Hahn and her grandmother, Janet Groven, visit a weekly soup kitchen in Charles City, Iowa.

Amy Toensing, photographer for National Geographic

<http://proof.nationalgeographic.com/2014/07/23/amy-toensing-on-hunger-in-america-iowa-breadbasket/>

Consumption:
Food insecure
groups within
communities



COMPONENTS OF THE EMERGENCY FOOD SYSTEM

FOOD PANTRIES PROVIDE FREE FOOD TO CLIENTS

Food pantries and emergency kitchens are the main direct providers of emergency food assistance

- Private, community-affiliated
- About 40% of dietary intake among pantry users
- Increased reliance on emergency food pantries due to budget cuts in SNAP benefits
- Clients actively trying to access food, high potential to respond to interventions

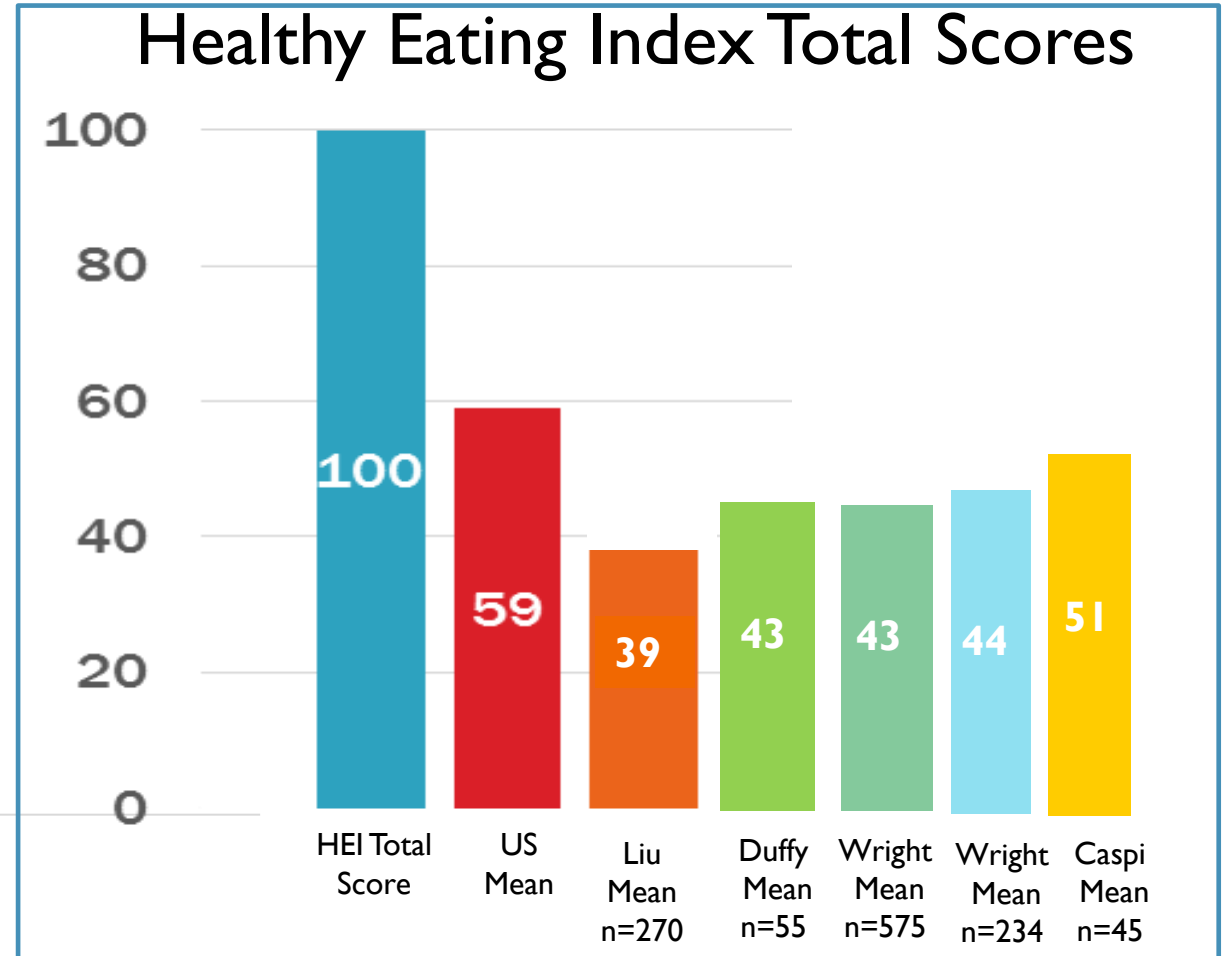
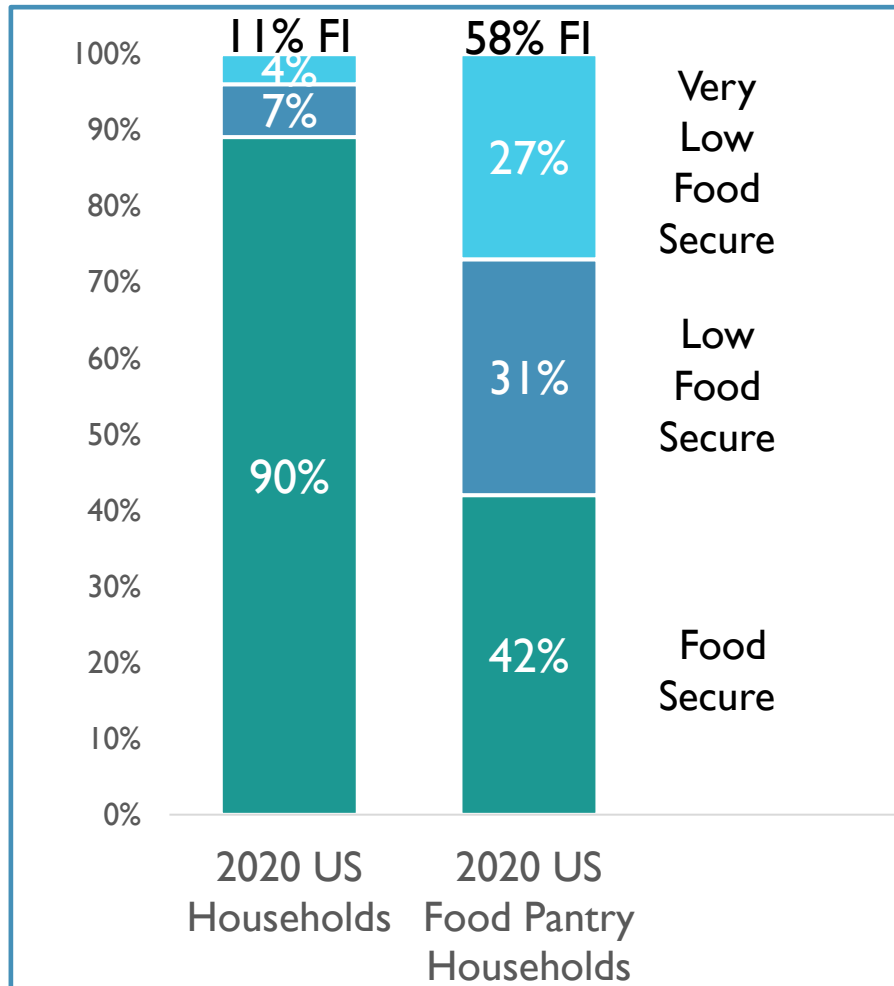


Liu, Y., Desmond, N., Wright, B., Bailey, R., Dong, T., Craig, B., & Eicher-Miller, H. (2021). Nutritional contributions of food pantries and other sources to the diets of rural, Midwestern food pantry users in the USA. *British Journal of Nutrition*, 125(8), 891-901. doi:10.1017/S0007114520003372

<http://www.feedingamerica.org/hunger-in-america/real-stories-of-hunger/>

Verpy H, et al. *J Nutr Educ Behav*. 2003;35(1):6-15.

FOOD INSECURITY IS PREVALENT AND DIET QUALITY LOW AMONG HOUSEHOLDS USING FOOD PANTRIES



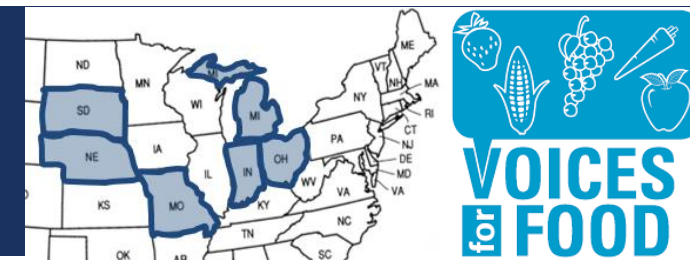
FOOD PANTRY CLIENTS EXPERIENCE PREVALENT CHRONIC DISEASE

Health outcomes among food pantry clients

	(Liu, 2019) Sample Prevalence	Other Studies	US Prevalence
Overweight or obesity	81.6%, 69% obesity	71.7% (Robiana, 2013)	72%, 38% obesity (Wang, 2015)
Prediabetes or diabetes	27.0%	24-34% (Perkett, 2017; Kaiser 2018)	9.3% (NCHS)
Hypertension	43.7%	72% (Perkett, 2017)	34% (CDC)
Hypercholesterolemia	36.7%	33% (Kaiser, 2018)	12.9% (CDC)
Heart disease	17.8%	12% (Perkett, 2017)	6% (CDC)
Stroke	11.5%	14% (Perkett, 2017)	2.7% (Benjamin, 2017)
Depression		18-82% (Seligman, 2018, Ippolito, 2016)	26% (Wittayanukorn, 2014))

- Diabetes, high cholesterol, heart disease, and stroke more than double US estimates
- Food pantry clients and their household members are an optimal group for an intervention to improve food security, dietary intake, and health

“VOICES FOR FOOD” INTERVENTION TO RURAL MIDWESTERN FOOD PANTRY CLIENTS



- Goals:
 - Improve Food Security, Diet Quality
- Design:
 - Longitudinal (2yr) Intervention:
 - VFF Toolkit
 - Experimental Component: Community Coaching
- Participants:
 - 24 pantries (IN, OH, MI, NE, SD, MO), n=600+clients

Establish Food Policy Councils focused on food insecurity and the food system in the community

Community Level



Organize pantry foods around MyPlate; Improving staff knowledge of nutrition and cultural competency

Food Pantry Organization Level



Improve dietary quality & food security; Improve knowledge of healthful diets and managing food dollars

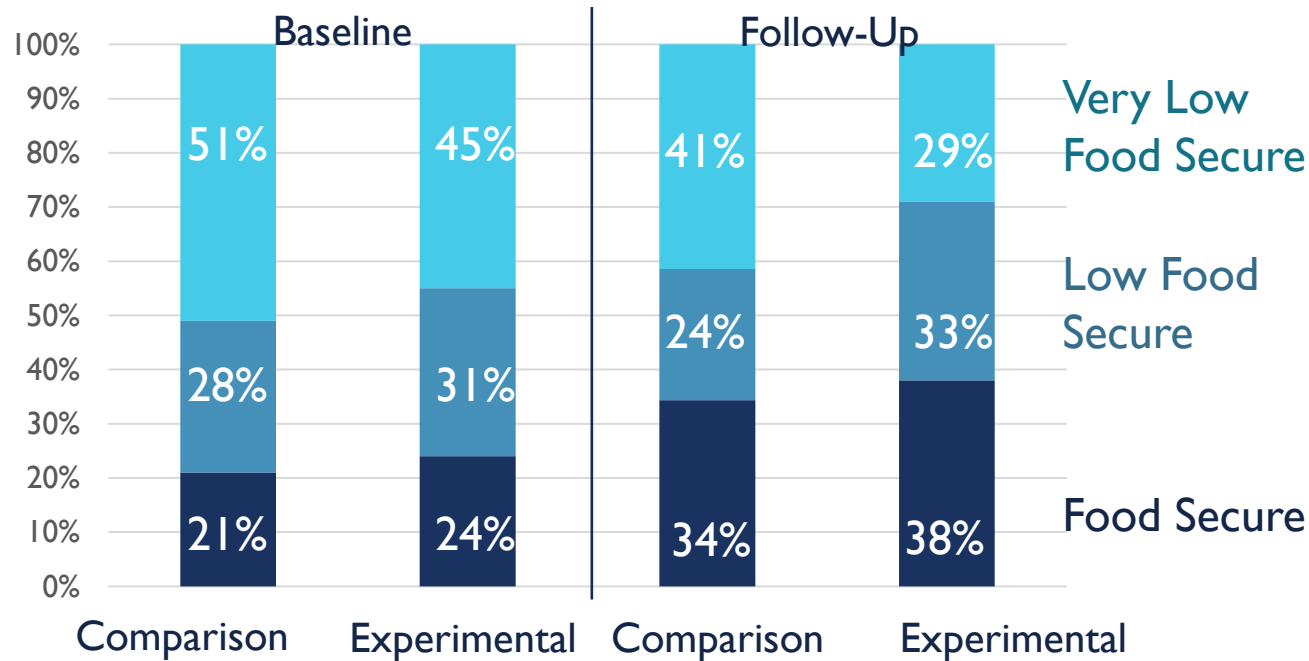
Food pantry clients & families



FOOD INSECURITY AND TOTAL DIETARY QUALITY WAS IMPROVED OVER TIME FOR BOTH INTERVENTION AND COMPARISON GROUPS

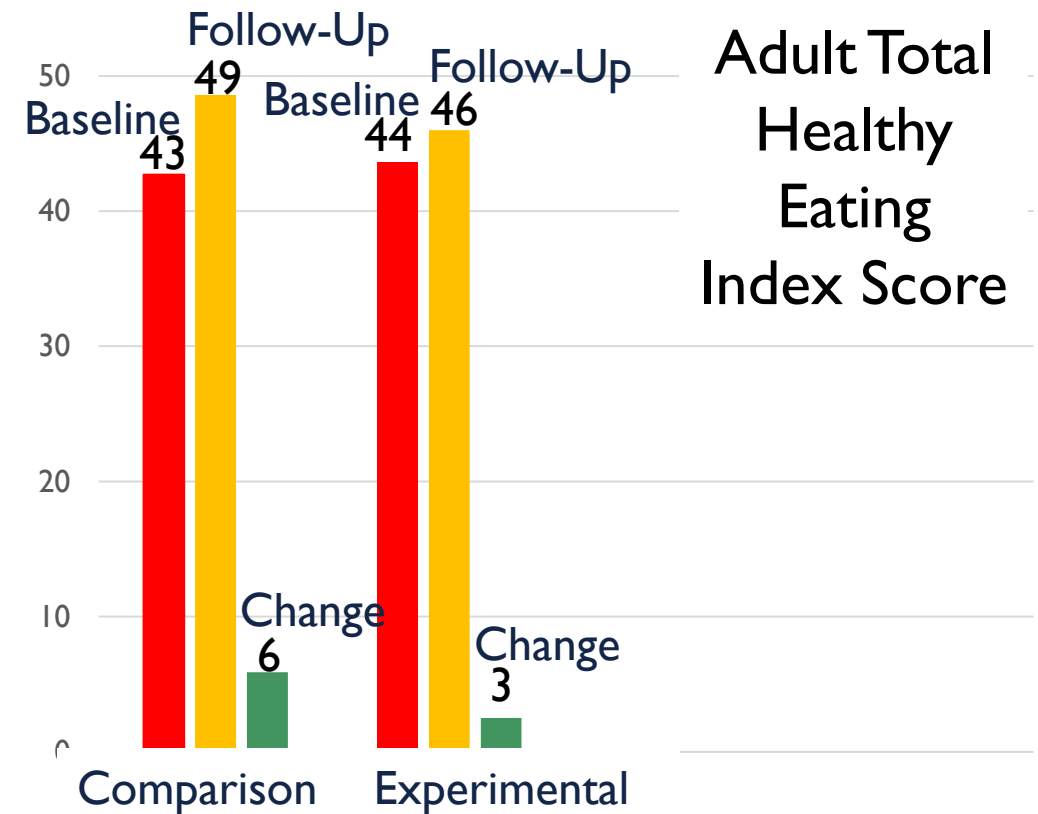
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Adult Food Security



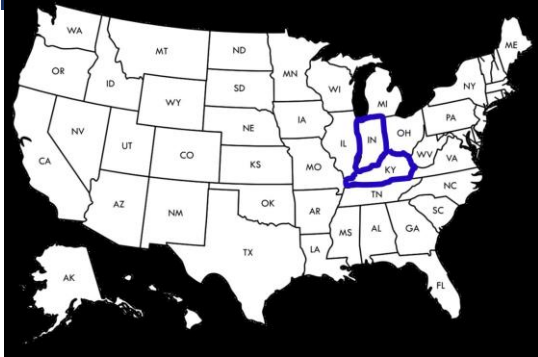
Food insecurity as high as 79%!
Participants significantly improved in adult food security by about 15% (-0.7 ± 0.3 ; $P=0.01$)

Wright et al; 2018; Stluka et al, 2018; Remley et al 2019; Liu et al, 2019; McCormack et al, 2019; Liu et al, 2020; Eicher-Miller, 2020; Wright et al, 2020; Liu et al, 2020; Eicher-Miller et al, unpublished.



Participants significantly improved in dietary quality (4.2 ± 1.1 ; $P<0.0001$)

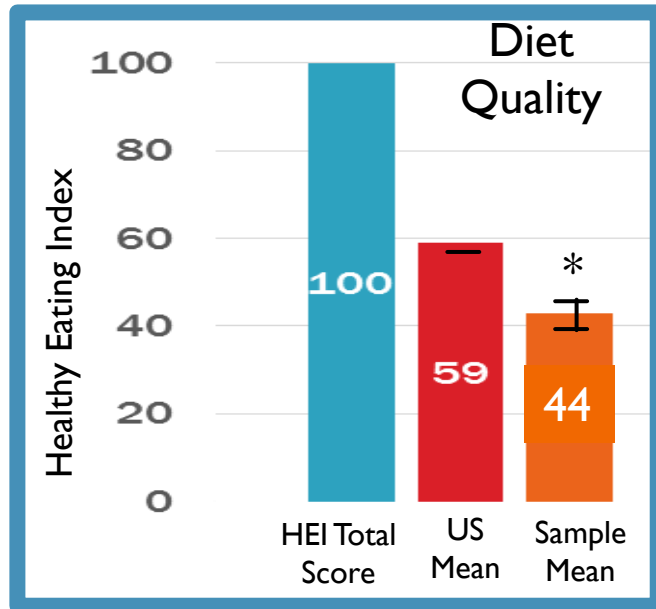
“REACHING RURAL VETERANS” INTERVENTION TO RURAL VETERANS



- Goals:
 - Improve Food Security Design:
 - Longitudinal (6 mo)
 - Intervention: Monthly Outreach Events, Veteran Sensitivity/Food insecurity Training to Pantry Staff, Nutrition Education
- Participants:
 - 10 pantries (IN & KY), n=234 veterans



FOOD INSECURITY WAS REDUCED AND RESOURCE USE WAS ENHANCED AFTER THE “REACHING RURAL VETERANS” INTERVENTION



77% food insecurity

Table 2: Food Security, Enrollment in SNAP and Enrollment in TANF/SSI/GA/ATT in Rural IN and KY Veteran Adult Participants of the Reaching Rural Veterans Project at Baseline and Follow-Up (n=125).

	Baseline <i>n</i> (%)	Follow-up <i>n</i> (%)	McNemar's test <i>P</i>
Household Food Security			0.03*
Food Secure	32 (29)	45 (42)	
Food Insecure	77 (71)	63 (58)	
Adult Food Security			0.01*
Food Secure	40 (35)	51 (45)	
Food Insecure	74 (65)	63 (55)	
SNAP			0.02*
Enrolled	47 (39)	54 (44)	
Not Enrolled	75 (61)	68 (56)	
TANF/SSI/GA/ATT			0.005*
Enrolled	10 (9)	23 (19)	
Not Enrolled	108 (91)	97 (81)	

Odds of food security improved 10%, use of resources (SNAP + ≥ 1 more assistance programs) by 11% after RRV

IMPLICATIONS: INTERVENTIONS IN THE EMERGENCY FOOD SYSTEM MAY BE EFFECTIVE TO IMPROVE FOOD SECURITY & DIET

The case for interventions in the emergency food system

- High potential to serve very low food secure populations
- Can reach low-density populations (rural areas)
- Reach groups who do not have access to SNAP and other resources and those for whom these resources are not enough
- Community base provides links to other resources and relationships
- Food pantries have existing infrastructure and resources to build from
- Provide food with potential to improve quality of diet
- **NEEDS:** greater connection between emergency food system, food assistance, and other resources to close the gap in eligibility and use of resources, how individuals use programs over time

FOOD INSECURITY, A FOCUS ON SOLUTIONS

*EXAMPLE 1:
EMERGENCY FOOD ASSISTANCE*

*EXAMPLE 2:
NUTRITION EDUCATION*



Picture from Daviess County, Indiana: SNAP-Ed client making a fruit and yogurt smoothie with her child

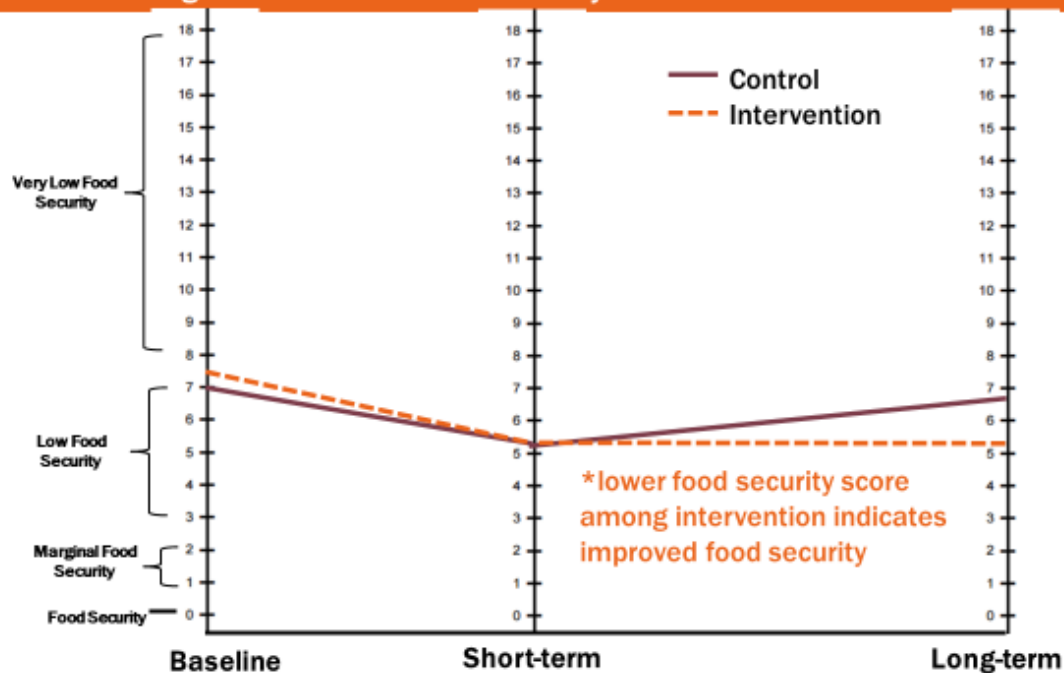
GOALS OF SNAP AND SNAP-ED ARE TO IMPROVE FOOD SECURITY AND DIET

- **Supplemental Nutrition Assistance Program (SNAP)** : asset based program (<130% of poverty line) that provides additional vouchers for food based on people, ages in household
- **SNAP**: has been extensively evaluated, SNAP participants are between 14.9 to 36.6% less likely to be food insecure than SNAP nonparticipants
- **SNAP-Ed**: provides nutrition education to SNAP-qualifying households
- **SNAP-Ed** very little rigorous evaluation



NUTRITION EDUCATION IMPROVES FOOD SECURITY WITH SUSTAINED IMPROVEMENTS OVER 1 YEAR LATER

Mean Change in Household Food Security Across Time



Household food security among SNAP-Ed participants improved by 25% from baseline to 1 year later.

- Nutrition Education (SNAP-Ed), independent of SNAP, improved food security, using a randomized, controlled trial
- SNAP-Ed improves food security regardless of urban or rural location, several program factors, or the environmental factors like access to the emergency food system, housing prices, or SNAP-authorized stores.
- SNAP-Ed did not improve dietary quality in adults using a randomized, controlled trial...we are investigating to see if other dietary effects are observed in children

IMPLICATIONS: NUTRITION EDUCATION CAN BE AN EFFECTIVE PART OF THE SOLUTION TO FOOD INSECURITY

- Nutrition education promotes healthful dietary choices on a budget so that each family can tailor their diet to their needs, preferences, and health
- SNAP-Ed reaches a group with prevalent food insecurity
- SNAP-Ed program reaches very small percentage of SNAP eligible group and one of few resources to reach rural counties
- Nutrition education to one adult in the household can improve food security in the long-term to the entire household
- **NEEDS: expand reach of SNAP-Ed, research investments to long-term evaluation, food security over time, food & nutrition security within families, how multiple programs are used**

FOOD INSECURITY, A FOCUS ON SOLUTIONS

Interventions through the emergency food assistance system and nutrition education are effective to improve food security and

CONCLUSIONS: *may be important components to focus on for future solutions.*

