SDSU Extension

South Dakota Farmers and Ranchers

Health and Wellness Preliminary Findings

Farmers and Ranchers in South Dakota

- #1 Industry in South Dakota
  - 46,000 producers on 31,000 farms or ranches
- Rural geography
  - Distanced from resources and community
  - Limited access to services
- Viewed as high labor/rigorous effort job
  - Technology, equipment advancements, etc.
- Farmers are more likely to experience high stress, social isolation, psychological distress, and suicide compared to other rural groups.

Common Stressors in Farm Families

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Mental Health Concerns of Farmers & Ranchers

- The impact of stress on the mental health of farmers is an international concern.
- Recent depression rates in agricultural workers have varied from 7.4% to 24%.[1,2]
- In 2012, the Center for Disease Control and Prevention (CDC) listed agriculture as the occupational group with the highest rate of suicide overall (84.5 per 100,000 population).[3]
- Gender differences exist as rural males maintain higher suicide rates than rural females in most countries.[4]
- Agricultural sustains one of the highest mortality rates from stress-related illnesses.[5]

Preliminary Studies: Methods

- Farmer and Rancher Recruitment
  - E-mail recruitment, Dakotafest, SE and NE Farm Tour Days, Flyers, iGrow website; Radio
  - $10 Gift card Incentive

- 2015 Assessment Tools:
  - Beck Depression Inventory and Interpersonal Support Evaluation List
  - Questions regarding perceptions and access to mental health services

- 2017 Assessment Tools:
  - International Physical Activity Questionnaire, The Major Depression Inventory and The Perceived Stress Scale
  - Demographics, military status and farming operation questions added
  - Data collected June – September

South Dakota Preliminary Studies: Depression and Anxiety

2015: 172 farmers and ranchers

- Depression symptoms
  - Roughly 8.7% reported mild, moderate, or severe depression symptoms
  - Of the 106 males, 12.2% reported symptoms
  - Of the 65 females, 3.1% reported symptoms
  - At least 12.8% responded that life wasn't worth living at least some of the time.
  - Only 12% would seek help from a counselor.

2017: 106 farmers and ranchers

- Depression symptoms
  - Roughly 17% reported mild, moderate, severe, or extremely severe symptoms.
  - Of the 66 males, 16.7% reported symptoms.
  - Of the 40 females, 17.5% reported symptoms.
- Anxiety symptoms
  - Roughly 15.2% reported mild, moderate, severe, or extremely severe symptoms.
  - Of the 66 males, 12.1% reported symptoms.
  - Of the 40 females, 20% reported symptoms.

South Dakota Preliminary Studies: Depression and Anxiety

2015: 172 farmers and ranchers

- Risk factors for depression:
  - Single
  - Previous military service
  - Farm/ranch is the only source of income
  - Lacks friendship support

2017: 106 farmers and ranchers

- Risk factors for depression:
  - Age (younger farmers)
- Risk factors for anxiety:
  - Age (younger farmers)
  - Occupation (farmers had higher anxiety scores than ranchers)
  - Previous military service

Mental Health Stigma

- A negative stigma exists regarding mental health issues, and to protect their family reputation, farming families tend to view psychiatric treatment as least desirable.[7]
- Farmers tend to disclose to family members or friends rather than seeking professional help.
- Farm families may live in isolated geographic locations in which access to mental health services is limited.

https://www.canr.msu.edu/managing_farm_stress/

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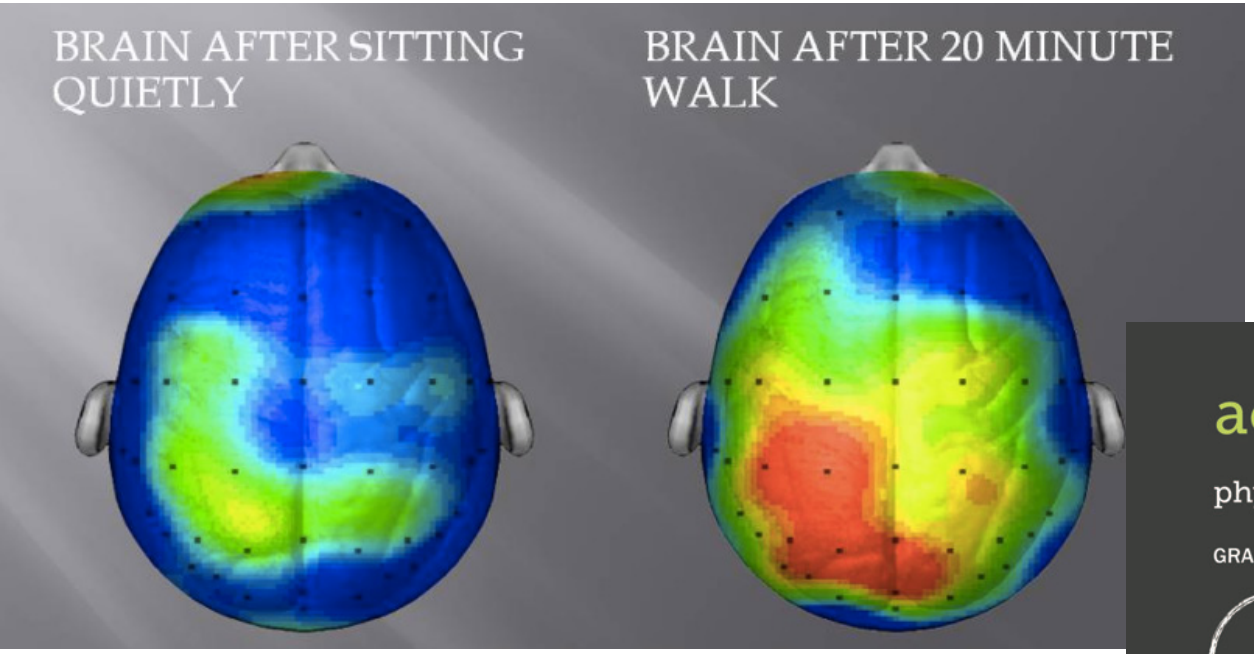
Brain Benefits of Physical Activity

- Aerobic activity protects brain against cognitive decay to age-related and psychiatric disorders.[8]
- Aerobic exercise leads to the release of *brain-derived neurotrophic factor,* a protein that promotes functions crucial to memory, learning, and higher thinking. [11]
- Exercise releases endorphins, chemicals that diminish sensations of pain, act as sedatives, and also trigger a sort of euphoric, energized feeling in the brain.[11]
- Exercise is a natural and healthy stress reliever



active kids learn better

ACTIVE LIVING RESEARCH

physical activity at school is a win-win for students and teachers

GRADES:

20% more likely to earn an A in math or English

STANDARDIZED TEST SCORES:

increased 6% over 3 years

JUST ONE PHYSICALLY ACTIVE LESSON CREATES:

13% increase in students' physical activity for the week

21% decrease in teachers' time managing behavior

physically active kids have more active brains

BRAIN SCANS OF STUDENTS TAKING A TEST:

after 20 minutes of sitting quietly

after 20 minutes of walking

Red areas are very active; blue areas are least active.

MORE RESULTS:

after 20 minutes of physical activity:

students tested better in reading, spelling & math and were more likely to read above their grade level

after being in a physically active afterschool program for 9 months:

memory tasks improved 16%

SOURCES: Donnelly J.E. and Lambourne K. (2011). Classroom-based physical activity, cognition, and academic achievement. Prev Med. 52(Suppl 1):S36-S42. Hillman C.H. et al. (2009). The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children. Neuroscience. 159(3):1044-1054. Kamijo K. et al. (2011). The effects of an afterschool physical activity program on working memory in preadolescent children. Dev Sci. 14(5):1046-1058. Kibbe D.L. et al. (2011). Ten years of TAKE 10!: integrating physical activity with academic concepts in elementary school classrooms. Prev Med. 52(Suppl 1):S43-S50. Nelson M.C. and Gordon-Larson P. (2006). Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. Pediatrics, 117(4): 1281–1290.

Learn more about why active kids learn better and how schools can help at activelivingresearch.org/activeeducationbrief.

Physical Activity Statistics in South Dakota

- **50.8%** of South Dakota adults meet the aerobic guidelines of 150 minutes or more per week
- **28.3%** of South Dakota adults participate in muscle strengthening exercises 2 or more times each week
- **18.6%** of South Dakotans participate in enough aerobic and muscle strengthening physical activity to meet the overall guidelines

SD-BRFSS, 2017

South Dakota Preliminary Studies: Physical Activity

2017: 106 farmers and ranchers

- Overall, 90% of survey respondents were categorized as 'high' physical activity
  - High = >1 hour PA/day
- Unusual Finding
  - Future research
  - Qualitative Data
- Limited studies assessing farmer and rancher physical activity
  - Majority research done in Australian Rural Populations [12-14]
- Physical activity levels are seasonal, sporadic and unplanned[15]

Rural Physical Activity Data

Effect of level of farm mechanization early in life on bone later in life

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Abstract

Objective: To determine whether an active rural lifestyle during childhood and adolescence, defined as low farm mechanization, was associated with bone measures later in life. **Methods:** DXA bone data from total body, hip and spine, and pQCT data from 4% and 20% distal radius were obtained on 330 individuals (157 women) aged 20-66 years who farmed at least 75% of their lives. Primary bone outcomes included areal bone mineral density (aBMD), aBMD Z-scores, cortical and trabecular volumetric BMD, cortical thickness and periosteal circumference. Relationship between bone and recall of level of farm mechanization as a child was determined after stratifying by sex and controlling for covariates. **Results:** Controlling for covariates, females from low mechanized farms had higher femoral neck (FN) bone area ($p=0.03$) than those on high or moderate mechanized farms. No group differences in pQCT ulna measurements or z-scores were found in either gender. **Conclusion:** A low farm mechanization level (high physical activity) prior to 20 years of age is associated with greater FN bone area in females. Future research that includes type and amount of physical activity performed will contribute to growing knowledge of how and when regular physical activity during childhood and adolescence affects adult bone health.

Rural Physical Activity Data

Table 2. Marginal means (± SE) and p-values for physical activity (per week and weekend day), stratified by sex.

	Miles Walked	Stair Flights	Sleep Weekday	Sleep Weekend	Sit Weekday	Sit Weekend	Light Weekday	Light Weekend	Moderate Weekday	Moderate Weekend	Vigorous Weekday	Vigorous Weekend
Females												
NH Non-Rural	2.1 ± .07^{a}	8.2 ± .38^{a}	7.3 ± .06^{a}	7.8 ± .06^{a}	5.0 ± .11^{ab}	4.3 ± .09^{a}	7.8 ± .13^{ab}	7.4 ± .13^{ab}	3.5 ± .11^{ab}	4.1 ± .10^{ab}	.43 ± .03^{ab}	.47 ± .02^{a}
NH Rural	2.1 ± .08^{b}	7.2 ± .43^{b}	7.4 ± .06^{b}	7.8 ± .07^{b}	4.4 ± .13^{a}	4.2 ± .10^{b}	6.9 ± .15^{ac}	7.0 ± .14^{ac}	4.8 ± .13^{a}	4.5 ± .11^{ac}	.58 ± .03^{a}	.46 ± .02^{b}
Hutterite	2.7 ± .06^{ab}	10.5 ± .30^{ab}	8.8 ± .04^{ab}	10.2 ± .05^{ab}	4.3 ± .09^{b}	5.8 ± .07^{ab}	5.6 ± .10^{bc}	5.3 ± .10^{bc}	4.7 ± .09^{b}	2.6 ± .08^{bc}	.53 ± .02^{b}	.18 ± .02^{ab}
Male												
NH Non-Rural	2.2 ± .11^{a}	9.5 ± .47^{a}	7.1 ± .06^{a}	7.6 ± .07^{a}	6.0 ± .15^{ab}	4.7 ± .12^{a}	7.3 ± .16^{a}	7.4 ± .16^{a}	3.0 ± .16^{ab}	3.6 ± .13^{ab}	.63 ± .06^{a}	.74 ± .05^{a}
NH Rural	1.9 ± .09^{b}	6.9 ± .40^{ab}	7.3 ± .05^{b}	7.7 ± .06^{b}	4.1 ± .13^{ac}	4.4 ± .10^{b}	6.9 ± .14^{b}	7.1 ± .14^{b}	4.9 ± .13^{ac}	4.1 ± .11^{ac}	.82 ± .05^{a}	.74 ± .04^{b}
Hutterite	3.1 ± .09^{ab}	8.8 ± .37^{b}	8.4 ± .05^{ab}	10.2 ± .06^{ab}	3.4 ± .12^{bc}	5.4 ± .10^{ab}	5.4 ± .13^{ab}	6.2 ± .13^{ab}	6.1 ± .12^{bc}	2.1 ± .10^{bc}	.74 ± .05	.15 ± .04^{ab}

*Similar superscripts indicate significant difference between groups within sex and outcome variable at p≤0.05*Values for miles and stairs are per day*Values for sleep, sit, light, moderate and vigorous are in hours per day. *Analyses control for time (months since baseline visit), baseline age (centered), body mass index and season.

Rural Physical Activity Data

Table 2. Anthropometric and Physical Activity Measures Among Pediatric Female and Male Hutterites and Non-Hutterites (n=58).

	Hutterite		**Non-Hutterite**		***P-value***		
	F *(n=20)*	**M** *(n=18)*	**F** *(n=8)*	**M** *(n=12)*	**Group**	**Sex**	**Sex-by-group**
Physical Activity Measures							
Accelerometer*	*(n=20)*	*(n=15)*	*(n=8)*	*(n=11)*			
% in light	28 ± 1.4	23 ± 1.7	24 ± 2.3	24 ± 1.9	NS	NS	NS
% in moderate	10 ± 0.6	10 ± 0.7	9 ± 0.9	9 ± 0.8	NS	NS	NS
% in vigorous	12 ± 1.4[a]	18 ± 1.6[b]	15 ± 2.1[a,b]	11 ± 1.8[a]	---	---	0.01
% in MVPA	22 ± 1.6[a,b]	28 ± 1.9[a]	24 ± 2.6[a,b]	20 ± 2.2[b]	---	---	0.02

MVPA: moderate plus vigorous physical activity

Data are least square means ± standard error of the mean. Statistical tests were done using a 2-way ANOVA (model includes group, sex and group-by-sex), and Tukey's HSD post hoc analysis to compare individual means where the interaction term was significant. If the interaction term was not significant it was not included when testing the significance of the main effects. Significant difference in means is denoted by different letter subscript in cases where group-by-sex interaction term is significant. NS, not significant; BMI, body mass index.

* Values expressed as % of time during waking hours.

Pulling it all together

- Rural vs urban research
  - Need – for so many reasons!
    - Disparities, factors of influence, accessibility
- Rural vs urban interventions
  - Similar problems, different solutions
- Need for solutions
- Location vs occupation vs lifestyle
  - Not just opposite of urban

Interventions and Programming

- Partnerships
- Future Research Goals
  - Focus Groups
  - Objective Measures
  - Intervention and Program Development
    - App or Texting Program
    - Counseling/Training for Bankers

Discussion Questions

- How do we best reach farmers?
  - Location? Partner? Organization?
- What might farmers do?
  - ‘Worksite wellness’?
- Addressing potential mental health stigma

Resources

- www.mantherapy.org
- Extension
  - South Dakota State University: www.igrow.org
  - North Dakota State University: https://www.ag.ndsu.edu/ndsuag
  - Michigan State University: https://www.canr.msu.edu/managing_farm_stress/
  - University of Wisconsin-Madison: www.agsafety.info
- Iowa Concern
  - 24 hour hotline: 1-800-447-1985
- Farm Aid
  - 800.FARM.AID (800-327-6243)
  - Connecting farmers to the best resources in their local area
- eXtension Webinars:
  - Bjornestad, A., Brotherson, S., Olson, C., Pish, S., & Van Ginkel, M. (2017). Communicating with Farmers Under Stress. eXtension Webinar: https://mediaspace.msu.edu/media/farmer_stress/1_0ewas7h5
  - Katrovich, A., Bjornestad, A., Shutske, J., & Pish, S. (2018). Communicating with Farmers Under Stress: Part 2. eXtension webinar: https://drive.google.com/file/d/1hVtDeh5bPHr0p2uNCFEFbRQcwF5pGap0/view

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