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Factors Affecting Food Choices of Men in Production Agriculture in Kansas

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PREVIOUS
ARTICLE



ISSUE
CONTENTS



NEXT
ARTICLE

Factors Affecting Food Choices of Men in Production Agriculture in Kansas

Abstract

With 86% of American farms individually or family operated, farmers' health becomes imperative to sustaining profitability. This research collected data on food choices of farmers in Kansas to determine potential gaps in nutrition knowledge that could be addressed by Cooperative Extension programs. Participants (N=147) attended nine K-State Research and Extension Agricultural Profitability Conferences in November 2001, completing the Block Brief Questionnaire and eating behavior and demographic questions. Results indicated subjects were overweight and food choices did not meet dietary guidelines. Cooperative Extension should capitalize on its extensive history with this population to provide one-on-one nutrition education materials targeting producer diets.

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Introduction

Diet affects the health of men in production agriculture, just as it does that of men in other occupations. The *National Center for Health Statistics 2001 Rural Chartbook* lists heart disease, cancer, and stroke as the leading causes of death in the United States. All these diseases have links to nutrition. The book also notes that there are distinct health challenges confronting the most rural counties with more dispersed and older populations (National Center for Health Statistics [NCHS], 2001).

The health of agricultural producers is vital to maintaining a vibrant agricultural economy. According to the 1997 Census of Agriculture, Kansas had 61,593 farms, most of which were family-owned. K-State Research and Extension is an important source of information for farmers and their families (K-State Research and Extension, 2002). It is therefore important for Cooperative Extension to provide nutritional information targeting the individual operators of these farms so they can lead healthy and productive lives.

Nutrition and health are strongly linked. The American Heart Association identified smoking, elevated cholesterol, physical inactivity, obesity, and diabetes mellitus as the major risk factors of heart disease (American Heart Association [AHA], 2001). One-third of the cancer deaths that occur in the United States annually are due to nutritional factors, including obesity (American Cancer Society [ACS], 2001).

In 2002, the National Heart, Lung, and Blood Institute released the first federal guidelines on the identification, evaluation, and treatment of overweight and obesity. Overweight was defined as a Body Mass Index (BMI) of 25 to 29.9 kg/m, and obesity as a BMI of \geq 30 kg/m (National Heart Lung

and Blood Institute [NHLBI], 2002).

With these known links to diet and disease, Americans should be eating more healthily. However, according to the *Eating in America Today II (EAT II)* study, American diets do not reflect the recommendations as illustrated in the food pyramid, with a strong base in grains, fruits, and vegetables (USDA, 1992). Of the six food groups in the pyramid, the *EAT II* study found that only the meat and poultry group was consumed within the dietary guidelines. Fruits, vegetables, and grains are under-consumed. Although foods in the fats/oils/sweets group should be eaten sparingly, consumption exceeded the recommendations (Smith, 1995).

Research has indicated that men have more limited meal preparation skills and nutrition knowledge than women do. Harnack, Story, Martinson, Neumark-Sztainer, and Stang (1998) found that 23% of men were involved in meal planning, 36% in shopping, and 27% in meal preparation. Younger men and men in households in which the female head of household worked full-time were more involved in meal planning and preparation. Redman (1980) studied the impact of women's time allocation on expenditures for meals away from home and purchase of prepared foods. Even though more women were working outside the home, they still retained a majority of the responsibilities for food selection and preparation activities. However, this situation was less pronounced for the noon meal, where women were less likely to influence men's food choices.

Tepper, Choi, and Nayga (1997) examined the effects of restrained eating, nutrition knowledge, beliefs about selected foods, and demographic variables on self-reported food choices of men. Restrained eating was defined as the conscious attempt by an individual to regulate body weight. Dietary restraint was a consistent predictor of food choice in the male population studied. Urban residency, income, age, and nutrition knowledge also were found to influence men's food choice.

The Framingham Heart Study, initiated in 1948 as a longitudinal, population-based study of cardiovascular disease, is one of the most comprehensive studies of men's health. It later broadened its scope to include other chronic diseases. Findings indicated that with increased nutrition knowledge, dietary habits more closely approximated food pyramid recommendations (Millen et al., 1997).

Most of the research on the health of men in production agriculture has focused on farm stress and injury or on the link between pesticide use and cancer (Kidd, Scharf, & Veazie, 1996; Agriculture Health Study, 2002). Limited research was found that investigated the food choices of men in production agriculture.

Purposes

The purposes of the research described here were to obtain baseline food choice data of men in production agriculture and to determine if these food choices were affected by:

- Restrained eating,
- Perceived nutrition knowledge of the participants, and/or
- Off-farm employment of the spouse

Hypotheses were that fruit, vegetable, grain, meat, and fat consumption would not be affected by restrained eating, perceived nutrition knowledge, or spouse working off-farm.

Additional research questions included:

- How does body mass index (BMI) of men in production agriculture compare with the recommended BMI for healthy weight?
- Where do men in production agriculture eat their noon meal in harvest and non-harvest times?
- What amount of time do men take for the noon meal during harvest and non-harvest times?
- What are the sources of nutrition/health information utilized by men in production agriculture?

Results of this research provided insight into eating behaviors and gaps in nutrition knowledge that could be addressed by Cooperative Extension Service educational materials.

Methodology

Participants in this study attended one of the nine Agricultural Profitability Conferences conducted in varying geographic locations in Kansas. Conferences were sponsored jointly by K-State's Agricultural Economics Department and the Kansas State University Agricultural Experiment Station and Cooperative Extension Service (K-State Research and Extension). Protocol approved by Kansas State University's Institutional Review Board for Human Subjects was followed.

The brief version of the Block Health Habits and History Questionnaire, (Block Brief) was used to assess food consumption practices (Block, Hartman, & Naughton, 1990). Questionnaires were purchased from the University of California at Berkeley through the Nutrition Quest Web site (University of California at Berkeley [UCB], 2001). The Block Brief included questions about age,

gender, height, weight, and food choice. Fourteen questions were added to the Block Brief to obtain information related to the hypotheses and research questions.

The instrument was self-administered to the volunteers during or immediately following the noon meal. The researcher was present to clarify questions and to ensure that participants understood the procedure for completing the instrument. The Block Brief included pictures of certain foods for visual clarification of serving sizes and to aid in estimating food consumption.

Frequency of consumption for individual food items was coded based on the following scale:

- .00 = no response
- .015 = a few times a year
- .03 = once per month
- .08 = 2-3 times per month
- .14 = once per week
- .29 = twice per week
- .50 = 3-4 times per week
- .79 = 5-6 times per week
- 1 = once a day.

This scale was created using a servings-per-day concept (example: five to six times per week was on average 5.5 servings divided by seven days in a week, or .79).

The amount of a food eaten was coded for a standard serving size and varied based on the food consumed. Total consumption of each food was determined by multiplying the frequency of consumption for a food by the factor representing the amount consumed of that same food. Results could then be reported in servings per day. Data were combined into groups: fruit, vegetable, meat, grain, and fat for hypothesis testing (Breslow, Subar, Patterson, & Block, 1997). SPSS 10.0 for Windows was used to analyze data (SPSS, 2000). T-tests and ANOVAs tested the hypotheses.

Results

Demographics

From the 322 seminar attendees, 147 useable surveys were completed, for a 46% response rate. The mean age of study participants was 48 years, and mean weight was 198 pounds. Average BMI of respondents was 27.7, with 70.5% having a BMI \geq 25.

Net annual income was \diamond \$40,000 for 60% of participants. This was comparable to the mean household income of \$50,000 for the State of Kansas reported in the 2000 Census (United States Census Bureau [USCB], 2001). Fifty-nine percent had obtained either a bachelors or masters degree, compared to 25.8% statewide (USCB, 2002). Approximately half (49.3%) of respondents' spouses were employed off the farm for more than 4 hours per day.

Frequency of Consumption of Food Groups

Fruits (1.28 servings/day) and vegetables (1.80 servings/day) were consumed less than grain, fats, and meat (Table 1). Grains had the highest mean daily consumption (3.5 servings/day), followed by fat (2.1 servings/day). Chicken (.24 servings/day) and fish (.01 servings/day) had the lowest mean daily consumption. Five percent of respondents reported never eating fish. For a copy of the foods included in each group, interested persons may contact the authors.

Table 1.
Frequency of Food Consumption by Group in Servings per Day

Food	N*	Minimum**	Maximum**	Mean/Std. Deviation**
Grains	119	.60	10.23	3.49 \pm 1.82
Fat	130	.01	8.50	2.11 \pm .59
Meat	115	.28	7.91	1.92 \pm 1.24
Vegetables	118	.24	5.40	1.80 \pm .94
Dairy	120	.02	6.02	1.56 \pm 1.13

Desserts	131	.06	6.80	1.36 Å 1.23
Fruit	129	.00	.07	1.28 Å 1.02
Red Meat	132	.02	2.66	.57 Å .45
Chicken	134	.00	2.02	.24 Å .28
Fish	132	.00	.86	.01 Å .01
<p>*Numbers may vary depending on the number of respondents answering a particular question. **Servings per day based on the following scale: .00 = nothing;.015 = a few times a year;.03 = once per month; .08 = 2-3 times per month; .14 = once per week; .29 = twice per week; .50 = 3-4 times per week; .79 = 5-6 times per week; 1.0 = every day; multiplied by amount consumed.</p>				

Frequency of Restrained Eating and Perceived Nutrition Knowledge

Many respondents did not adjust their eating habits based on weight or health concerns. For example, 57.4% of the respondents disagreed with the statement "I frequently do not eat a food because I think it might cause me to gain weight." Forty-four percent disagreed with the statement about restrained eating "I frequently do not eat a food because I think it is bad for my health." The majority (66%) agreed that their nutrition knowledge was appropriate for maintaining a healthy diet. When asked to rate their nutrition knowledge, 41.2% rated it as excellent, and 16% reported their nutrition knowledge as poor.

Eating Behaviors by Time and Location

For the noon meal during harvest, 54.3% ate a sack lunch in the field, and 36.2% took a 10-15 minute break to eat. In winter or during other slower farming periods, 83.9% of participants ate at home, and 41.4% took 20-30 minutes to eat the noon meal.

Analysis of Restrained Eating, Perceived Nutrition Knowledge, and Spouse Working Off-Farm

Results indicated that those respondents who consumed more fruit practiced restrained eating and had a higher perceived nutrition knowledge (Tables 2 and 3). The spouse working off-farm also significantly affected fruit consumption; men ate more fruit when the spouse did not work off-farm (Table 4). No other food group showed any significance with these variables.

Table 2.
Frequency of Restrained Eating by Food Groups

I frequently do not eat a food because I think it might cause me to gain weight.				
Variable*	N**	Mean/Std Dev***	f-value	Sig
Fruit				
Agree	36	1.53 Å .77 ^a	4.45	.01
Not Sure	15	.66 Å .53 ^a		
Disagree	75	1.24 Å 1.09 ^a		
Vegetable				
Agree	33	1.76 Å .88	.01	.99
Not Sure	13	1.76 Å .86		

Disagree	69	1.79 Å .99		
Grain				
Agree	32	3.28 Å 1.46	.21	.81
Not Sure	16	3.46 Å 1.85		
Disagree	68	3.54 Å 1.97		
Meat				
Agree	30	1.72 Å 1.05	.61	.55
Not Sure	16	2.04 Å 1.00		
Disagree	76	2.00 Å 1.35		
Fat				
Agree	36	1.77 Å 1.47	1.78	.17
Not Sure	16	2.62 Å 1.88		
Disagree	75	2.20 Å 1.57		
I frequently do not eat a food because I think it might be bad for my health.				
Variable*	N**	Mean/Std Dev***	f-value	Sig
Fruit				
Agree	44	1.61 Å 1.13 ^a	5.72	.00
Not Sure	23	1.27 Å .93		
Disagree	59	.98 Å .79 ^a		
Vegetable				
Agree	42	1.95 Å .99	1.42	.25
Not Sure	23	1.80 Å .89		
Disagree	50	1.62 Å .90		
Grain				
Agree	41	3.41 Å 1.65	.41	.67
Not Sure	23	3.76 Å 1.84		
Disagree	52	3.36 Å 1.94		
Meat				
Agree	36	1.62 Å 1.09	1.71	.19
Not Sure	23	2.02 Å 1.18		
Disagree	55	2.10 Å 1.34		
Fat				

Agree	46	1.69 Å 1.35	2.94	.06
Not Sure	22	2.25 Å 1.61		
Disagree	50	2.43 Å 1.70		

*For a list of items included in food groups contact the authors.
**Number may vary based upon responses.
***Scale of frequency of consumption in servings per day; .00 = never; .015 = few times a year; .03 = once a month; .08 = 2-3 x a month; .14 = once per week; .29 = twice per week; .50 = 3-4 x a week; .79 = 5-6 x a week; 1.0 = once a day; multiplied by amount consumed.

Table 3.
Perceived Nutrition Knowledge of Respondents by Food Groups

Variable*	N**	Mean/Std Dev***	f-value	Sig
Fruit				
Agree	84	1.42 Å 1.00 ^a	4.22	.02
Not Sure	27	.96 Å .87		
Disagree	15	.81 Å .83 ^a		
Vegetable				
Agree	75	1.82 Å .97	1.51	.23
Not Sure	26	1.86 Å .93		
Disagree	14	1.37 Å .65		
Grain				
Agree	79	3.39 Å 1.74	.51	.60
Not Sure	22	3.80 Å 1.99		
Disagree	15	3.30 Å 1.96		
Meat				
Agree	76	1.90 Å 1.35	.10	.91
Not Sure	23	2.01 Å .92		
Disagree	15	1.99 Å 1.15		
Fat				
Agree	85	2.05 Å 1.54	.29	.75
Not Sure	26	2.29 Å 1.71		
Disagree	16	2.28 Å 1.72		
How would you rate your nutrition knowledge?				
Variable*	N**	Mean/Std Dev***	f-value	Sig

Fruit				
Excellent	50	1.32 Å .79	.66	.52
Average	58	1.27 Å 1.15		
Poor	17	1.00 Å .92		
Vegetable				
Excellent	46	1.75 Å .94	.13	.88
Average	50	1.84 Å .96		
Poor	18	1.73 Å .91		
Grain				
Excellent	51	3.70 Å 1.93	2.16	.12
Average	46	3.04 Å 1.56		
Poor	18	3.88 Å 1.99		
Meat				
Excellent	46	1.97 Å 1.46	.28	.76
Average	51	1.86 Å 1.02		
Poor	16	2.10 Å 1.28		
Fat				
Excellent	52	1.97 Å 1.45	1.01	.37
Average	55	2.15 Å 1.51		
Poor	19	2.58 Å 2.12		
<p>*For a list of items included in the food groups contact the researcher. **Number may vary based upon responses. ***Scale of frequency of consumption in servings per day; .00 = never; .015 = few times a year; .03 = once a month; .08 = 2-3 x a month; .14 = once per week; .29 = twice per week; .50 = 3-4 x a week; .79 = 5-6 x a week; 1.0 = once a day; multiplied by amount consumed. ^apost hoc tests significant differences</p>				

Table 4.
Spouse Working Off-Farm

Is your spouse working away from the farm more than 4 hours a day?				
Variable*	N**	Mean/Std Dev***	t	Sig (2-tailed)
Fruit				
Yes	61	.96 Å 1.01	-3.51	.00
No	58	1.58 Å .89		

Vegetables				
Yes	52	1.71 Å .85	-.49	.63
No	57	1.79 Å 1.01		
Grain				
Yes	56	3.19 Å 1.61	-1.85	.07
No	53	3.83 Å 2.01		
Meat				
Yes	52	1.74 Å .85	-1.67	.10
No	56	2.14 Å 1.54		
Fat				
Yes	61	2.07 Å 1.50	-.59	.55
No	59	2.24 Å 1.75		
<p>*For a list of items included in the food groups contact the researcher. **Numbers may vary depending on the number of respondents answering a particular question. ***Scale of frequency of consumption in servings per day; .00 = never; .015 = few times a year; .03 = once a month; .08 = 2-3x a month; .14 = once per week; .29 = twice per week; .50 = 3-4x a week; .79 = 5-6 x a week; 1.0 = once a day multiplied by amount consumed.</p>				

Sources of Nutrition/Health Information

Most respondents (48%) obtained nutrition/health information from their spouse. Other sources included doctor (15%) and television (12%). Most farmers (34.5%) wanted to continue obtaining nutrition/health information from their spouses, 16.8% from a doctor, and 10.6% from a dietitian. Only seven respondents (5.7%) reported that they currently received nutrition/health information through K-State Research and Extension programs, and five respondents (4.4%) stated that K-State Research and Extension would be a source in the future.

Discussion and Conclusions

The mean BMI of 27.7 and the fact that 70.5% of participants had a BMI \geq 25 are consistent with national trends and indicate that participants are overweight. The servings per day of foods eaten in our sample reflect the conclusion of Smith (1995) that the American population does not follow food pyramid guidelines. The amount of grains, fruits, and vegetables consumed also were below food pyramid recommendations for the subjects in our study. Meat consumption approximated the suggested 2-3 servings. Fat consumption, at an average 2.1 servings, was higher than the "use sparingly" recommendation of the food pyramid (USDA,1992). These results support findings of the *EAT II* study that reported men ate fewer servings of most food groups than recommended, except meat and fat (Smith, 1995).

Our study did not support the findings of Tepper, Choi, and Nayga (1997), that dietary restraint was a consistent predictor of food choice in a community-based population of adult men. Most respondents in this study never practiced restrained eating. For those who did, there was a consistent increase in fruit consumption. No other food group was affected by restrained eating.

The study population rated their perceived nutrition knowledge as excellent to average, yet this

was not reflected in their actual food choices. Perceived nutrition knowledge was found to affect only fruit consumption. When participants indicated that their nutrition knowledge was appropriate for maintaining a healthy diet, their fruit consumption increased.

Fruit consumption significantly decreased for those whose spouse worked off-farm. Since 50% of spouses worked off the farm, the researcher predicted that the study population would rely on commercial foods for their noon meals. However, the study's results do not support this conclusion. The respondents most often ate their noon meal at home or as a sack lunch where food and calorie consumption could still be controlled by the spouse. The choice of a sack lunch also could be related to time constraints.

Weight status, food choices, the limited practice of restrained eating, and a high perceived nutrition knowledge without corresponding healthy food selection suggest that the study population would benefit from improved food consumption. These individuals could be considered at high risk for heart disease, cancer, and stroke (AHA, 2001; ACS, 2001). The risk could be heightened considering that the population is more rural than urban and more dispersed. They live farther from health care sources and are older (NCHS, 2001).

Implications for Extension and Further Research

- The men in production agriculture who responded to this study are at nutritional risk and don't appear to be concerned about the interaction of diet and health.
- The health of agricultural producers is vital to maintaining a vibrant agricultural economy.
- Because Cooperative Extension has a long-term association with men in production agriculture for dissemination of information, this relationship could be exploited to target nutritional information to producers.
- Gender-specific educational materials could be developed by Extension Family and Consumer Science (FACS) specialists that target the male agricultural producer and his spouse about their grain, fruit, and vegetable consumption (Millen et al, 1997).
- Agriculture and FACS agents in individual counties could partner to provide educational materials to producers in group settings.
- Educational materials could be utilized by Agriculture and FACS agents for weekly radio programs and newsletters.
- Because spouses are the primary choice for nutrition information, FACS agents could provide educational sessions for spouses.
- State-level specialists should continue to cooperate across Agriculture and FACS to provide nutritional educational materials at statewide Extension events and programs for agricultural producers.
- Cooperative Extension should be a source for nutrition education materials and encourage their use in the one-on-one settings with doctors, dietitians, or spouses.
- Cooperative Extension is positioned as an active advocate for the health of agriculture producers in Kansas and potentially nationwide

A limiting factor to this study was the small population. It should be replicated with a larger sample of men in production agriculture. Research could be expanded to include sample populations in other states to increase validity of results. A different research tool might be considered that is shorter in length than the Block Brief, because respondents commented on the challenge of completing a detailed questionnaire. Future research in this area also might include assessment of physical activity and snacking behaviors. Most important, research should be conducted to determine what would motivate this group to change their current behaviors to positively impact their health.

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