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## Abstract

**Background:** Research suggests that a diet with plant protein has health benefits. Recently, participants with low income who completed a pilot meal kit study ranked the vegetarian recipes as least desirable. Research is needed to better determine plant protein preferences in populations with low income, which may highlight the need for programs that encourage the consumption of plant-based proteins.

**Objective:** To compare utilization and mean satisfaction of meat, seafood, and vegetarian recipes in rural and suburban communities with low income.

**Study Design, Settings, Participants:** Rural (N=42) and suburban (N=28) main preparers of food in a household with at least one child participated in a six-week meal kit intervention. Each kit contained three recipes (meat, seafood, and vegetarian). Demographic data were collected at baseline, and recipe usage and satisfaction data were collected weekly.

**Measurable Outcome/Analysis:** Demographic data were analyzed using descriptive statistics. Utilization frequency and average satisfaction of recipe types were determined for each community.

**Results:** Participants were on average age 45.8±12.5, white (47.1%) or black (44.3%), and primarily female (88.6%) and non-Hispanic (98.6%). Most (87.1%) fell below 200% of the 2021 federal poverty line and prepared at least four of each recipe type (meat=85.9%, seafood=82.9%, and vegetarian=76.1%). The least prepared recipes in both communities were vegetarian (rural=81.0%, suburban=71.4%) while the most prepared were meat (92.9%) and seafood (82.1%), respectively. In the suburban community, 70.4%, 85.7%, and 96.3% of participants who prepared the vegetarian (n=27), meat (n=28), and seafood (n=27) recipes, respectively, liked the recipes somewhat or a great deal. Whereas 80.0%, 95.2%, and 97.6% of participants in the rural community who prepared the vegetarian (n=40), meat (n=42), and seafood (n=41) recipes, respectively, liked the recipes somewhat or a great deal.

**Conclusion:** Vegetarian recipes were the least prepared and liked recipes in both communities. It's unclear whether this is due to taste preferences, familiarity with or perceived value of ingredients. More exposure to and education about vegetarian recipes may be needed to increase acceptance in communities with low income.

## Background

Well-planned, plant-based diets are healthful, nutritionally adequate, and appropriate for all stages of the life cycle.<sup>[1]</sup> In addition to the environmental benefits, research suggests that a diet with plant protein has health benefits. The reduced consumption of meat may improve health by lowering the chance of obesity, risk for heart disease, high blood pressure, and type 2 diabetes.<sup>[1]</sup> Many of these benefits can be attributed to the fact that compared to non-vegetarians, vegetarians usually eat fewer calories from fat (especially saturated fat), fewer overall calories, as well as more fiber, potassium, and vitamin C.<sup>[1]</sup>

The Dietary Guidelines for Americans recommends shifts within the protein foods group to add variety to subgroup intakes. Selecting from alternate protein subgroups such as beans, peas, and lentils more often could help meet recommendations while still ensuring adequate protein consumption.<sup>[2]</sup> Recently, participants with low income who completed a pilot meal kit study ranked the vegetarian recipes as least desirable.<sup>[3]</sup> Research is needed to better determine plant protein preferences in populations with low income, which may highlight the need for programs that encourage the consumption of plant-based proteins.

## Objective

To compare utilization and mean satisfaction of meat, seafood, and vegetarian recipes in rural and suburban communities with low income.

## Study Design, Settings, Participants

Rural (N=42) and suburban (N=28) main preparers of food in a household with at least one child participated in a six-week meal kit intervention that provided three meals per week. Demographic data were collected at baseline, and recipe usage and satisfaction data were collected weekly.

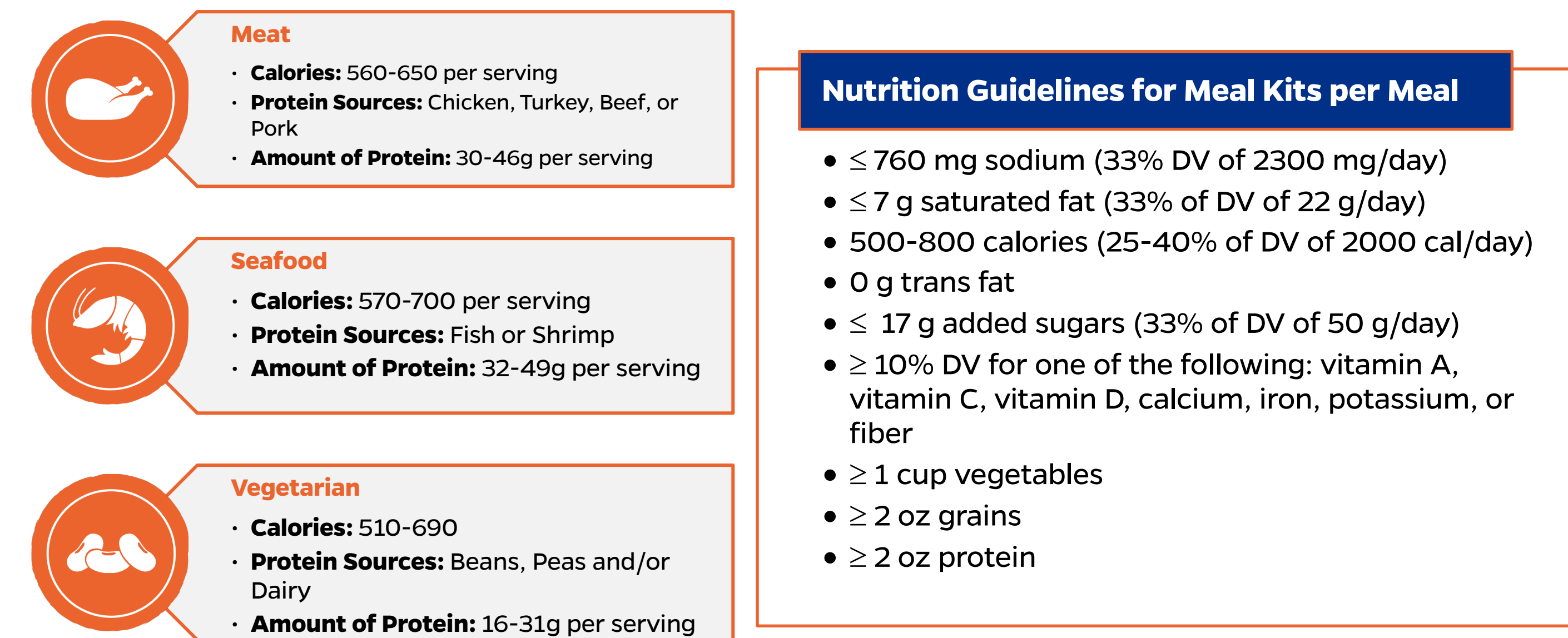


Figure 1. Overview of Weekly Recipes by Type

## Measurable Outcome/Analysis

Demographic data were analyzed using descriptive statistics. Utilization frequency and average satisfaction of recipe types were determined for each community using SPSS. An independent samples t-test was conducted to compare the average number of each recipe type prepared between rural and suburban communities.

## Results

Table 1. Participant Demographic Characteristics

Characteristic	Rural (n=42)	Suburban (n=28)	Combined (n=70)
Gender, %			
Male	7.1	14.3	10.0
Female	92.9	82.1	88.6
Non-Binary/Third Gender	N/A	3.6	1.4
Ethnicity, %			
Non-Hispanic	100.0	96.4	98.6
Hispanic	N/A	3.6	1.4
Race, %			
Black/ African-American	50.0	35.7	44.3
White	42.9	53.6	47.1
Two or more races	7.1	10.7	8.6
Age (years; mean)	47.0±12.96	44.1±11.93	45.8±12.54
Household size (mean)	4.4±1.38	4.4±1.77	4.4±1.54
% with Household Income ≤\$49,999	95.2	100.0	97.1

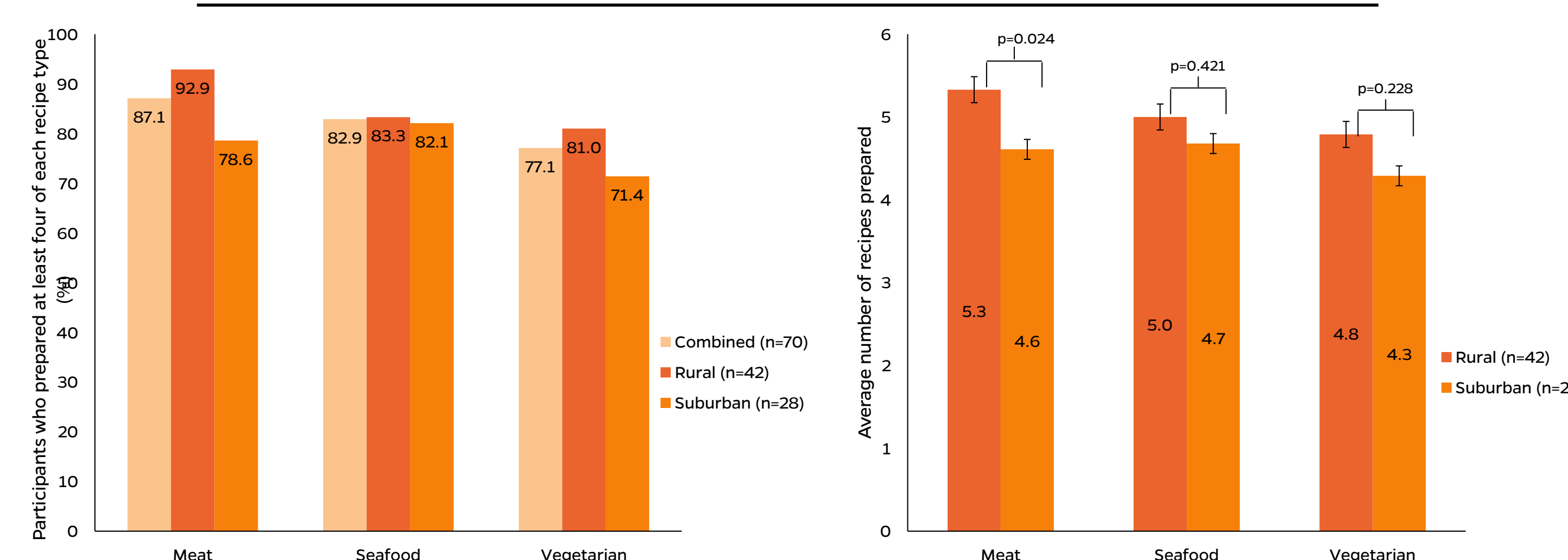


Figure 2. Preparation Rate of Recipe Types in Rural and Suburban Households

Figure 3. Average Number of Each Recipe Type Prepared in Rural and Suburban Households

## Results (continued)

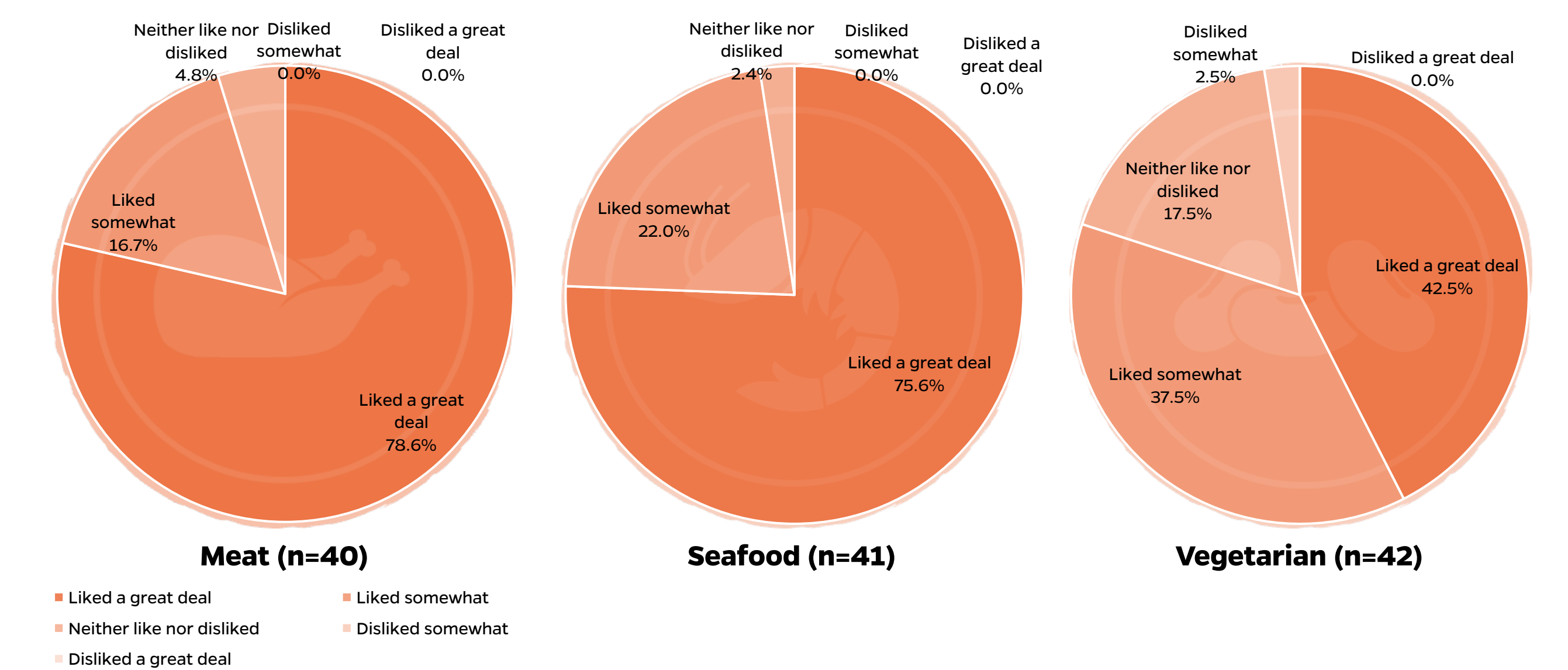


Figure 4. Average Satisfaction with Prepared Recipe Types in Rural Households

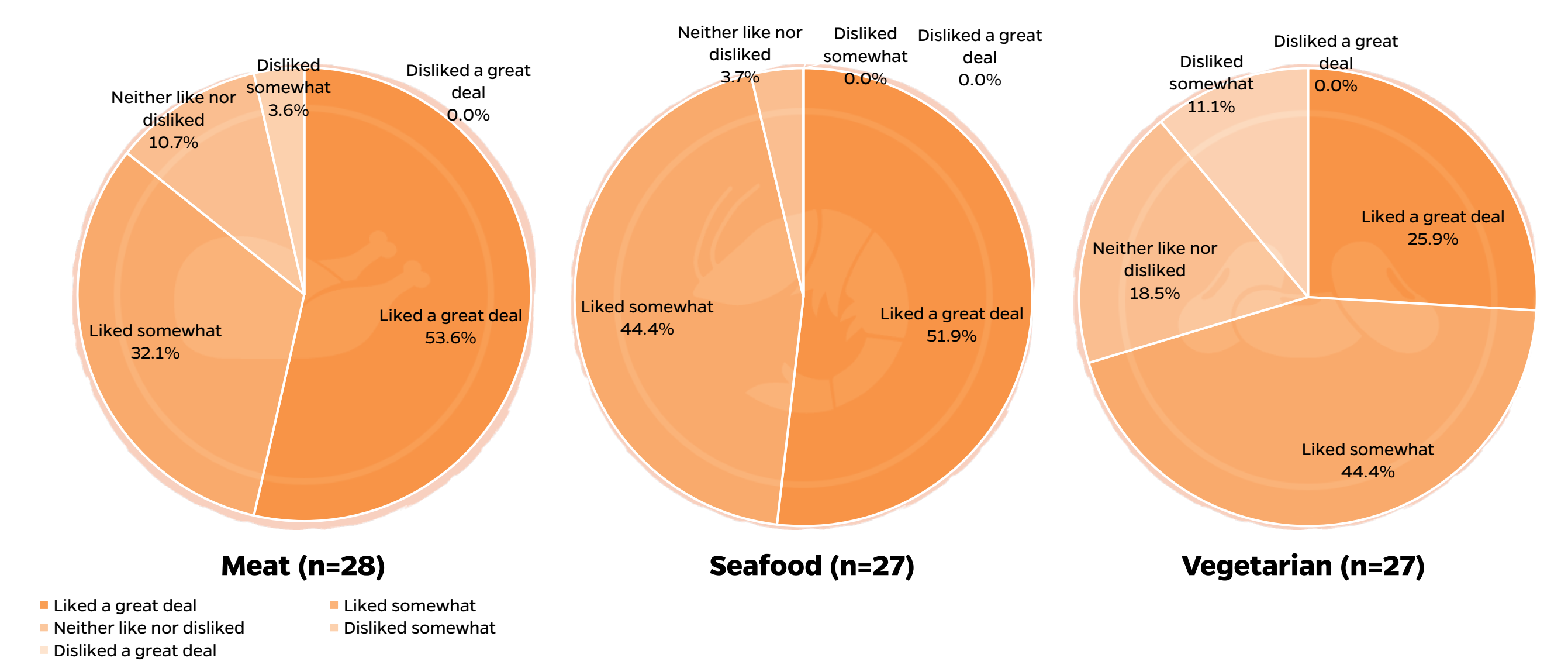


Figure 5. Average Satisfaction with Prepared Recipe Types in Suburban Households



Picture 1. Hearty Spinach Salad (Meat Recipe) prepared by participant in rural community.



Picture 2. Summer Salmon (Seafood Recipe) prepared by participant in rural community.



Picture 3. Baked Caprese Tortellini with Arugula Salad (Vegetarian Recipe) prepared by participant in suburban community.

## Conclusions

Vegetarian recipes were the least prepared (Figure 2) and liked (Figure 4 and Figure 5) recipes in both the rural and suburban households. The average number of meat recipes prepared in rural communities was significantly ( $p=0.024$ ) higher than suburban communities and was the only significant difference (Figure 3). It's unclear whether low preparation and satisfaction of vegetarian recipes is due to taste preferences or familiarity with or perceived value of ingredients. More exposure to and education about vegetarian recipes may be needed to increase acceptance in communities with low income.

## References

[1] Melina, V., Craig, W. and Levin, S., 2016. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. *Journal of the Academy of Nutrition and Dietetics*, 116(12), pp.1970-1980.  
[2] U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans*, 2020-2025. 9th Edition. December 2020.  
[3] Carman, K., Sweeney, L., House, L., House, L., Mathews, A. and Shelnett, K., 2021. Acceptability and Willingness to Pay for a Meal Kit Program for African American Families with Low Income: A Pilot Study. *Nutrients*, 13(8), p.2881.