P19-027-24 U.S. Household Food Security Survey Module Questions Predict Dietary and Nutrient Quality Among Low-Income Adults to Inform Measures of Nutrition Security-NHANES 2007–2018

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Objectives: Food security, or enough food to support an active and healthy life, is assessed using the U.S. Household Food Security Survey Module (HFSSM). Nutrition security is related, as reliable, fair access to nutritious, safe, and affordable foods for optimal health and well-being. Despite no official nutrition security metric, diet, nutrient quality and food security contribute conceptually to its dimensions. The relationship of affirming questions (indicating food insecurity) within the U.S. HFSSM to diet quality, using the Healthy Eating Index-2015 (HEI-2015), and nutrient quality using the Food Nutrient Index (FNI), was evaluated in U.S. adults of households without children to inform their inclusion in a nutrition security measure.

Methods: Backward regression (adjusted for NHANES survey factors and diet weights) was applied to individual responses on the U.S. HFSSM from 59,842 low-income adults (≥18y) of the U.S. National Health and Nutrition Examination Survey (NHANES) 2007-2018 in separate models against the total and component HEI-2015 and FNI, derived from ≤2 24-hour dietary recalls.

Results: Worrying about food (Question (Q) 2) was associated with lower HEI, 2.8 point, and FNI, 7.6 point, total scores and not eating for a whole day frequently (Q12a) was related to lower HEI, 3 point, and FNI, 10.7 point, total scores (all $p< 0.0001$). Yet, affirming that food did not last (Q3) was linked to higher HEI, 2.7 point, and FNI, 5 point, total scores and not eating for a whole day (Q12) linked to higher HEI, 1.8 point, and FNI, 7.4 point, total scores (all $p\leq 0.0001$). All four questions were similarly related to their consistent respective increases or decreases in ≥5 HEI and FNI component scores ($p\leq 0.05$) always including greens and beans, seafood and plant proteins, magnesium, vitamins D and E.

Conclusions: Affirming questions indicating limited food access on the U.S. HFSSM is significantly related to diet and nutrient quality among low-income U.S. adults from households of adults. Both questions where affirmative results indicate early (Q2, Q3) and later stages (Q12, Q12a) of food insecurity are linked to lower and higher diet and nutrient quality revealing the complexity of classifying nutrition insecurity. U.S. HFSSM questions should be further evaluated as components of a measure of nutrition security.

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P19-028-24 Changes in the Fatty Acid and Antioxidant Profile of Eggs and Forage Across the Grazing Season in a Southern Ohio-Based Pasture-Raising System for Layer Hens

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Objectives: There is growing interest in regenerative egg farming with a focus on soil health, increased biodiversity, and symbiosis between chickens and the environment. Foraging allows poultry access to nutrient-rich and biodiverse feed, producing eggs with a more favorable nutrient profile for human health. However, throughout the seasons, the quality and composition of the feed vary. The objective of this study was to investigate the impact of seasonal changes on the nutrient profile of eggs and forage in a Southern Ohio-based pasture system for layer hens.

Methods: Three forage (n=3) and 24 egg samples pooled to form n=12 replicate samples were collected monthly from May to December. Fatty acid profiles were determined using gas chromatography-mass spectrometry analysis. Carotenoid content was assessed colorimetrically. Vitamin content was assessed at a commercial laboratory.

Results: Egg characteristics differed by month. Yolk vitamin A content was higher in the late summer months ($p< 0.001$), while vitamin E content gradually increased over the season and was highest in November (118.1 ± 24.0 ug/g fresh weight; $p< 0.001$). Yolk carotenoid content was higher in mid-summer and late fall ($p< 0.001$). Total fatty acids were highest in May (20.1 ± 3.9 g per 100 g fresh yolk) and decreased over the year ($p< 0.001$). Total saturated, monounsaturated, and polyunsaturated fatty acids significantly differed by month ($p< 0.001$). Total yolk and forage omega-3 fatty acids were higher in May compared to the mid-summer and late fall months, and the yolk n-6: n-3 ratio was lower in the early summer and fall compared to July ($p< 0.001$). Yolk oleic acid content was highest in the month of May (8.1 ± 1.7 g per 100 g fresh yolk; $p< 0.001$). Finally, yolk ALA and DHA content were higher in the early summer, decreased over the summer months, increased again in the late fall, and then decreased in December ($p< 0.001$).

Conclusions: This study demonstrates significant changes in the fatty acid and antioxidant profile of pasture-raised eggs across the growing season relevant to consumers purchasing pasture-raised eggs in this region.

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