

# RESEARCH REPORT



## NPB RESEARCH GRANT FINAL REPORT FORMAT – HUMAN NUTRITION

As a requirement of each research grant, a final report detailing the project results must be provided to the National Pork Board. Please write the industry summary with the producer in mind. The remaining content of the report can be written for a scientific audience. ALL final reports must be submitted in the following format, or the report will be returned for correction. PLEASE DO NOT INCLUDE ANY TYPE OF COVER PAGE.

**Project Title:** Trends and effects of pork consumption on nutrient intakes, indicators of diet-quality, and markers of health status among participants in the National Health and Nutrition Examination Survey (NPB 21-143)

**Principal Investigator:** Taylor C. Wallace, PhD

**Institution/Affiliation:** Think Healthy Group, LLC

**Date Report Submitted:** 5.23.2023

**Industry Summary:** As stated in the contract, we require an industry summary of the project, suitable for immediate public release by the Board. The purpose of the industry summary is to provide producers with a quick reference to research results supported by Checkoff dollars. The content should include the following: an explanation of the objectives, descriptive narrative of how research was conducted, a discussion of the research findings sufficient to give a thorough understanding of the results and explain what these findings mean to the industry. This summary is to be written for non-technical audiences. Please include your contact information.

The objective of this study was to assess consumption patterns and the nutritional contribution of total, processed, fresh, and fresh-lean pork to the diets of participants age 2+ years enrolled in the National Health and Nutrition Examination Survey (NHANES) 2007–2018 data cycles. Mean intake of total pork among consumers was estimated to be  $79.5 \pm 0.82$ ,  $54.2 \pm 0.69$ ,  $54.6 \pm 0.93$ , and  $45.9 \pm 0.73$ , g/d for men, women, boys, and girls, respectively. Total pork consumption subtly increased intakes of total energy and several macro and micronutrients, and decreased diet quality scores (adults only) and consumption of other “healthful” food groups. Only subtle but clinically insignificant effects of pork intake on biomarkers of nutritional status (e.g., serum vitamin B<sub>12</sub> levels) were shown. These trends were largely driven by processed pork consumption and co-consumption of foods such as condiments. Increasing the availability and education around fresh-lean cuts may help to increase intake of protein and other key nutrients across certain

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project’s principal investigator. This report has not been peer-reviewed.



subpopulations, without adversely affecting diet quality and biomarkers of health status. Pork intake did not affect cognitive function in older adults.

**Key Findings:**

1. Please provide 3 to 5 bulleted points that highlight the most important findings of your study.
  - a. Pork intake increased intake of total energy and several macro and micronutrients.
  - b. Consumption of pork has been relatively stable over the past decade with slight decreases in processed pork intake and slight increases in fresh-lean pork intake.
  - c. Pork intake slightly detrimentally affected diet-quality in adults (not children) and this was driven by co-consumption with less healthy foods (e.g., condiments, white bread, etc).
  - d. Effects of pork intake on nutritional biomarkers were clinically irrelevant.
  - e. Pork intake did not affect cognition in older adults.
2. Additionally, in 2-3 sentences each, how would you explain the results of this project to:
  - **Academia colleagues:** Pork intake did not significantly impact the overall health status of participants; however, transitioning the population to fresh-lean pork options may help maintain optimal protein intakes while minimizing effects on nutrients such as sodium and saturated fat.
  - **Pork producers:** The pork industry should continue to innovate and expand the availability of fresh-lean pork products. This will benefit nutrition on a population level.
  - **Industry partners:** The pork industry should continue to innovate and expand the availability of fresh-lean pork products. It is important to either decrease amounts of processed pork options or help better educate consumers on how processed pork can be used alongside more healthful co-consumed food options. This will benefit nutrition on a population level.
  - **Consumer media/public:** Pork intake did not have any major detrimental effects on human health that would be considered clinically relevant. These cross-sectional data should not be used in consumer/media communications, as more concrete evidence from prospective cohort studies and randomized clinical trials (particularly regarding biomarkers of health and cognitive outcomes) are needed to substantiate these subtle effects (in some instances stronger evidence exists [e.g., cognition] and conflicts with these findings).

**Keywords:** include at least 5 keywords

Pork meat; red meat; diet; nutritional status; food, processed.

**Scientific Abstract:** This should be a scientific description limited to one page in length to describe your project and its results. (Not to exceed 300 words)

Please see the attached two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

**Introduction:** An overview of the researchable question(s) and its importance to producers, industry, and human nutrition.

Please see the attached two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

**Objectives:** From your research proposal.

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**Subjects & Methods:** This section should include experimental design, methods and procedures used, number of animals/humans, eligibility and exclusion criteria, institutional review board approval, statistical methods etc.

Please see the attached two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

**Results:** Report your research results by objective. Depending on the design of the study, include relevant participant flow charts such as CONSORT, STROBE-NUT, PRISMA, or ARRIVE.

Please see the attached two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

**Discussion:** Emphasize concisely the important aspects of the study and the conclusions that follow from them. Include the implications of the findings, their strengths, and limitations, and relate the observations to other relevant studies. State new hypotheses and recommendations when warranted by the results and label them clearly as such. Explain your research results and include a summary of the results that are of immediate or future benefit to pork producers.

Please see the attached two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

**Scientific Presentation(s):** Are you preparing to use the data from this project at a scientific conference or meeting? If so, please identify which conference(s) and/or meeting(s) you will be presenting at?

We plan to submit the results to several conferences including:

- American Society for Nutrition (2024) (*priority*)
- Korean Nutrition Society (2024) (*invited lecture; coincides with KNHANES work under NPB 22-056*)

**Publication(s):** Which journal(s) do you plan, or have you already submitted to? What is the current status of your manuscript (e.g., in preparation, under review, revise and resubmit, accepted, etc.)?

Two manuscripts that have been submitted to *Nutrients* (accepted; minor revision) and *Journal of Alzheimer's Disease* (under peer-review).

## CLOSING REMARKS

Please add page numbers at bottom center of each page. Do not include any other headers or footers. Final reports will be published on the National Pork Board website exactly as submitted **no later** than 12 months after receipt, but the industry summary will be released immediately.

**Please email the completed final report, accompanying tables, figures or graphics, and any abstracts, manuscripts or presentations related to this final report to [grants@pork.org](mailto:grants@pork.org) and CC: [nutrition@pork.org](mailto:nutrition@pork.org).** You will receive an electronic response when your report is received and verified for proper format. The preferred format for electronic copy is Microsoft Word – No PDF format please.

Any publications, presentations or abstracts of the project results, need to recognize proper funding credit by using this statement: “Funding, wholly or in part, was provided by the National Pork Checkoff” (Or in the case of state Pork Producers Association funding “on behalf of the [state] Pork Producers Association”).

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Thank you for your attention to these instructions. Please contact the Project Manager, Research at the National Pork Board, if you have any questions.

**Phone:** (515) 223-2765

**E-mail:** [grants@pork.org](mailto:grants@pork.org); CC: [nutrition@pork.org](mailto:nutrition@pork.org)

**Revised 5/2023**