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General Information

The Journal of Nutrition (JN/J Nutr) publishes nutrition research that addresses human, animal, cellular, and molecular nutrition. In particular, JN draws attention to research findings that identify the nutritional problems and possible solutions for various populations. JN advances our understanding of nutritional mechanisms and the complex interactions of nutrition with genetics, physiology, health, and behavior.

In their commitment to furthering nutrition science, the JN editors, reviewers, and staff have provided a consistently fast peer review and efficient publication process. Average time to first decision is 1 month, and most manuscripts are accepted for publication after thorough and expert peer review in about 3 months. Manuscripts undergo formatting and copyediting and are posted online as in-press articles in less than 1 month after acceptance. Final versions are published in print about 1 month later and are optimized for search engine recognition, indexed in multiple databases, and archived in LOCKSS. The most recent Google Scholar metric placed JN 2nd in the field of nutrition, behind only The American Journal of Clinical Nutrition (AJCN), another American Society for Nutrition (ASN) journal. Although JN represents only 1 of 79 journals in the ISI’s field of Nutrition and Dietetics, authors of JN manuscripts garnered over 9% of all citations in the field in 2013, earning JN an Impact Factor of over 4.2. Between 60 and 70% of online visits from the researchers, clinicians, educators, public health officials, and others who visit JN for current developments in experimental nutrition come from outside of the United States.

Statement of Scope

JN publishes peer-reviewed original research papers covering all aspects of experimental nutrition in humans and other animal species; special articles such as reviews and biographies of prominent nutrition scientists; and issues, opinions, and commentaries on controversial issues in nutrition. Supplements are frequently published to provide extended discussion of topics of special interest.

Teresa A. Davis, Ph.D. is Editor-in-Chief of JN. With the assistance and recommendation of Associate Editors (selected for their expertise in specific nutrition disciplines), the Editor-in-Chief accepts or rejects submitted manuscripts. Submitted manuscripts must comply with JN’s Instructions for Authors.

The premier journal in its field, JN has been in circulation since 1928. JN is an official monthly publication of the American Society for Nutrition. Membership in ASN includes a subscription to the online version of JN. JN publishes original research reported by authors in over 50 countries and is distributed worldwide to more than 1000 institutions, in addition to personal subscribers and ASN members. To provide expert evaluation of the various segments of the broad spectrum of nutrition research, the editorial office is assisted by scientists who serve as Associate Editors, editorial board members, and ad hoc reviewers chosen for their nutritional science expertise. They provide constructive evaluation and fair and rapid editorial processing. The frequency of citations to articles published in JN by scientists, clinicians, and others increases each year.

JN focuses on the review of manuscripts that address human, animal, cellular, and molecular nutrition. JN is especially interested in publishing manuscripts that advance the understanding of nutritional mechanisms in human populations, in animals, in relevant model organisms, in appropriate primary cells or cell culture models, and/or at the molecular level. Manuscripts addressing interactions of nutrition with genetics, physiological regulation, health outcomes, and behavioral outcomes are generally well suited for review by JN. Because the pages that can be published annually are limited, suitability is an important consideration in the review process. To facilitate review, the Editor-in-Chief previews all submitted manuscripts and independently or in consultation with an Associate Editor, decides if a manuscript is appropriate for review by members of JN’s editorial board and/or ad hoc reviewers. Manuscripts outside of the scope of JN are returned without the delay of a full review, generally within a week of submission. Authors may contact the Editor-in-Chief in advance to inquire about the potential suitability of their research topic for review.

Manuscript submissions and inquiries are encouraged. Manuscript style and formatting are described in the “Instructions for Authors” posted online at jn.nutrition.org/misc/instructions-for-authors.xhtml. Manuscript submissions should be made using JN online manuscript submission system (submit.nutrition.org). Direct inquiries to: jnsubmit@nutrition.org.

Types of Manuscripts

Research articles
Reports of studies of interest to the community of nutritional scientists will be published as research articles. Manuscripts should have a well-defined hypothesis and report on reproducible, quantifiable, and previously unconfirmed outcomes. Manuscripts related to nutrition in any species may be submitted. Substances studied should have clear nutritional value at doses that are not considered pharmacological and through normal process of nutrient assimilation.

The Subject Headings are:
Biochemical, Molecular, and Genetic Mechanisms in Nutrition
The Journal of Nutrition  Instructions for Authors

Nutrient Physiology, Metabolism, and Nutrient-Nutrient Interactions
Nutrition and Disease
Nutrient Requirements and Optimal Nutrition
Genomics, Proteomics, and Metabolomics
Nutritional Epidemiology
Community and International Nutrition
Nutritional Immunology
Ingestive Behavior and Nutritional Neuroscience
Nutritional Methodologies and Mathematical Modeling

Reviews
Most reviews published in JN will be part of a series entitled "Recent Advances in Nutritional Sciences (RANS).” These reviews will be published in a five-page (1) format and provide a recent rather than historical review of the subject matter. These reviews are published to provide current information related to the wide range of research topics of interest to the readers of JN and to serve as a useful resource for instructors of advanced nutrition courses. Authors are encouraged to cover the general background and history of the research area in a limited amount of space and to update the reader by citing good previously published comprehensive reviews. The majority of the text should deal with recent (last few years) information.

More comprehensive reviews and commentaries are published as “Critical Reviews.” Critical Reviews are meant to address and discuss published literature. They are not meant for presentation of new systematic reviews or an extensive analysis or reanalysis of data. JN will review suitable systematic reviews as regular research papers. Critical Reviews may be invited by the Editor-in-Chief or initiated by authors. For author-initiated reviews, it is strongly advised that an outline of the proposed review be submitted to the Editor-in-Chief prior to writing so that suitability for JN and the scope of the review can be determined before submission. JN does not publish comprehensive or categorical reviews of the literature, only the focused reviews as described above.

Issues and Opinions
Short essays presenting scientific analyses and viewpoints on issues in nutrition may be submitted to JN. These articles are generally limited to four printed pages (1). Additional Online Supporting Material (OSM) may be included, if essential.

Commentaries
Commentaries relative to concurrently published papers containing noteworthy findings will be published at the invitation of the Editor-in-Chief. The Commentary section may also be used to present ASN-related articles on nutritional science and education.

Biographies and historical perspectives
Biographical manuscripts are invited by the Biographical and Historical Editor after consultation with the ASN History Committee, but suggestions of subjects and authors are welcomed. Authors of potential articles on some historical aspect of nutritional science should consult with the Biographical and Historical Editor prior to submission of a manuscript, concerning its appropriateness for JN. Biographical sketches, including the References section, should be 2–4 published pages (1) in length with the number of cited publications limited to no more than 10. A complete bibliography of the writings of the subject, if available, can be published as OSM (see page 11 for instructions). A photograph of the subject should be included.

Letters to the Editor
Letters to the Editor may be submitted. Letters are expected to provide substantive comments on papers published in JN in the 6 months prior to the time a letter is submitted, or other subjects that are of broad interest to the nutrition research community. JN does not permit unpublished data to be presented in letters. The letter and a reply, if appropriate, are published together whenever possible. Letters, including up to 10 references, are limited to one JN page (1) and will be reviewed prior to acceptance.

Errata
When necessary to correct an error in a published manuscript, the corresponding author may submit an erratum for publication in JN. The erratum must be submitted using the JN online manuscript submission system (log in to the author area, click on “submit a new manuscript” and choose “erratum” as the Table of Contents category).

The erratum will be reviewed by the Editor-in-Chief and, if approved, published in the next available issue. The erratum should include the full citation of the original article (authors, title, J Nutr year;volume:page range) and explain the change or correction needed to the original published version. If the erratum includes a change in authorship, the Change of Authorship (2) form must be completed, signed by all authors, and submitted as instructed on the form. A submission fee will not be assessed for the erratum; page charges will not be assessed unless the erratum is lengthy and due to authors’ errors. Please see previously published errata for format (go to jn.nutrition.org; select Advanced Search; enter errata in Text/Abstract/Title field).

Other
JN also publishes supplements, based on extensive reports of research, monographs, compendia, proceedings of symposia, etc. Proposals for supplements must be submitted in advance and will be reviewed for appropriateness by the Editor-in-Chief. One or more
Submission Procedures

Manuscript submissions to JN must be made using the online system at http://submit.nutrition.org. Users are required to register when accessing the system for the first time. Detailed instructions and help files are also available online from the registration and submission areas of the manuscript submission system. If you experience serious problems, you can contact JN manuscript office: email: jnsubmit@nutrition.org. Questions related to the submission of a manuscript or changes in a manuscript submission should be submitted by the manuscript’s corresponding author. All correspondence from journal staff regarding a manuscript submission will be directed to the manuscript’s corresponding author.

Before submitting your manuscript, please make sure your manuscript has been formatted according to instructions below and in the “Manuscript Preparation” on Page 5 of this document. Please do not use Internet Explorer 5 to upload your manuscript.

Having the following information ready before starting your submission will save time:
1. If your paper is a resubmission, the previous manuscript ID# and a Response to Reviewers;
2. Your manuscript's title, abstract and keywords;
3. Your cover letter (see below);
4. All author names, affiliations and email addresses;
5. If you plan to suggest reviewers, their names, affiliation and email addresses.

Cover letter
A letter of submission from the corresponding author is a required field in the submission site. The cover letter may include information about OSM or auxiliary files submitted.

Manuscript file format
Word (.doc or .docx) files are the preferred format for manuscript text source files, and are required for revised manuscripts. Tables should be included after the references. Figures may be included as part of the manuscript source file only on initial submissions.

Fonts. Standard fonts, including Arial, Helvetica, Times Roman, Symbol, Mathematical PI, and European PI, are recommended in order to avoid potential problems with font substitution or embedding problems. All other fonts, if not embedded, may be replaced, resulting in data loss or realignment.

Supplemental file upload. Supplemental files for upload may include articles published/in press elsewhere, OSM, cover art submissions, reports or technical briefs related to manuscript submission, questionnaires, permissions, videos, etc. Clearly label each file as "Supplemental Data for Reviewers Only" or as "Online Supporting Material" if it is submitted for online publication.

Cover images. Authors are invited to submit color images for use on JN cover. Images can be figures included in a submitted manuscript, images that are representative of research reported in a submitted manuscript, or images that illustrate an aspect of nutrition research in general. Images should be 20.0 cm wide by 14.5 cm high (47 picas x 34.5 picas high). Images can be submitted in one of the following ways: 1) online during the manuscript submission process: load as a Supplemental File and, on the file upload page, indicate the file is a cover art submission; or 2) by email to the JN Editor-in-Chief, Dr. Teresa A. Davis; jnut@bcm.edu. Please include the manuscript number in all correspondence.

If an image is included in a submitted manuscript, copyright will transfer to the American Society for Nutrition. When an image is selected for a JN cover, authors will be asked to complete the Cover Illustration Permission and Description Form (4).

Manuscript submission/copyright release form
As publisher of JN, ASN holds the copyright on all JN articles. The 1978 copyright law requires that specific copyright transfer be obtained from all authors of each manuscript. All authors must read and sign JN Authors’ Statement and Copyright Release Form (5) and should submit the completed form as soon as possible and as instructed on the footer of the form. As recommended by the Council of Science Editors, when a coauthor dies or is incapacitated during the writing, submission, or peer review process, coauthors should obtain disclosure and copyright documentation from a familial or legal proxy (6). Revised manuscripts will not be processed until the completed form is received from each author.

Change in Authorship Form. A Change in Authorship Form (s) must be submitted if:
1. an author’s name is added to the manuscript,
2. there is a change in the author order, or
3. an author wishes to remove his/her name; a letter requesting the removal of his/her name and signed by the author must accompany the form.

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Manuscript Preparation

*JN* is limited in the number of pages that can be published each year, and article length is a consideration in the editorial process. Manuscripts up to 5000 words maximum from Introduction through Discussion, will be considered. Maximum word count does not include the Title Page, Abstract, Acknowledgments, Author Contributions, References, Figure Legends, or Tables. Authors are encouraged to be clear and concise. Papers must be completely double spaced. Number the lines continuously (not per page) beginning with the abstract and ending before the references, tables, and figures. Number pages consecutively in the upper right-hand corner of each page, beginning with the title page. Manuscript submissions that are not formatted correctly may be returned to authors. For a succinct list of formatting requirements, please see the Quick List Formatting on page 14. Foreign authors are advised to have their manuscripts reviewed by a colleague who is fluent in English.

*JN* encourages authors to provide the names, fields of interest, addresses, telephone and fax numbers, and e-mail addresses of 4–6 unbiased and qualified potential expert reviewers who do not have a conflict of interest.

**Include in your research manuscript:**

1. Title Page
2. Abstract page
3. Introduction
4. Methods
5. Results
6. Discussion
7. Acknowledgments and statement of authors’ contributions to manuscript
8. References

1. Title page
The title page must include:
   a. A title that is composed as a single declarative statement and focused on the results presented in the manuscript. The title should include the animals, participants, or cells studied. Please do not use a colon or semicolon in the title. Keep the title as generally applicable as possible. It usually is not necessary to include the exact study location or a specific study name in the title, because this information can be included in the abstract.

   b. The names of all authors (first name, middle initial, last name) as well as their departmental and institutional addresses. Indicate which authors are associated with which institutions with numbered footnotes. Identify a corresponding author and provide a mailing address, telephone number, fax number, and email address.

   c. A list of all authors’ last names exactly as they should appear for PubMed indexing. Please consider this carefully, in particular for authors with names that include hyphens and prefixes. Punctuation and spacing are generally disregarded when indexing, and the name will usually be indexed under the first letter to appear in the name. ASN will not replace files to correct author names once published.

   d. The word count for the entire manuscript (introduction through discussion).

   e. The number of figures (to print, not OSM).

   f. The number of tables (to print, not OSM).

   g. OSM submitted.

   h. A running title of 50 or fewer characters and spaces.

   i. Footnotes to the title disclosing: (i) the existence of OSM, if appropriate (see page 11); (ii) a list of abbreviations and their definitions for all abbreviations used in the text if there are 3 or more; (iii) all sources of financial support; (iv) Conflict of Interest and Funding Disclosure—List any existing financial arrangements between an author and a company whose product figures prominently in the submitted manuscript or between the author and any company or organization sponsoring the research reported in the submitted manuscript. If an author has no conflicts of interest, list the author's name, followed by "no conflicts of interest." For detailed guidelines on possible conflicts of interest, see the ASN Journals Conflict of Interest Guidelines (7).

2. Abstract page
A properly constructed and informative abstract is helpful for the initial editorial review of the submitted manuscript. Research articles must include a structured abstract that contains no more than 300 words, is written in complete sentences, includes information pertinent to any clinical trial registry in which a trial is registered, and uses the following headings:

**Background.** Provide 1 or 2 sentences that explain the context of the study.
**Objective.** State the precise objective, the specific hypothesis to be tested, or both.
**Methods.** Describe the study design, including the use of cells, animal models, or human subjects. Identify specific methods and procedures.
**Results.** Report the most important findings, including key data and results of statistical analyses.
**Conclusions.** Summarize in 1 or 2 sentences the primary outcomes of the study, including their potential importance (avoid generalizations). Include the participants, animals, or cells studied.
Review articles, special articles, and reports should include an unstructured abstract (no more than 300 words) that states the purpose of the article and emphasizes the major concepts and conclusions. Any abbreviations used in the abstract should be defined in the abstract at first mention.

Below the abstract, provide and identify 5–10 keywords or short phrases, including the subject group, that will help to increase the discoverability of your manuscript; do not use adjectives. Terms that are fundamental to your manuscript but are not included in your manuscript title or abstract are especially important to include to increase discoverability by indexing services such as PubMed.

Please note that during manuscript submission, you will be asked to supply keywords to assist the editors in locating suitable reviewers for your manuscript. Keywords for reviewer searches should include the terms most fundamental to your manuscript, and may differ from your list of keywords for publication.

3. Introduction
Describe clearly the background to the research conducted and the specific objectives. This should not be a comprehensive review of the literature, however. State the specific objective or hypothesis of the study.

4. Methods
Documentation of methods and materials used should be sufficient to permit replication of the research. Describe clearly the experimental design including the control and experimental groups. State the source of specialized materials, diets, chemicals, and instruments and other equipment, with model or catalog numbers, where appropriate. Specify kits, analyzers, and commercial laboratories used. Cite references for methods whenever possible and briefly explain any modifications made.

Human and animal research. Reports of human studies must include a statement that the protocol was approved by the appropriate institutional committee or that it complied with the Helsinki Declaration as revised in 1983. Registration is required for all clinical trials that began after July 1, 2010. When preparing reports of randomized, clinical trials, refer to the checklist published in the CONSORT Statement (8). Include a CONSORT flow diagram as a manuscript figure summarizing participant flow with the sizes (n) of initial (recruited, enrolled) and final groups. Indicate in both the abstract and the manuscript text whether the outcomes reported are primary or secondary outcomes of the study. For systematic reviews and meta-analyses, refer to the PRISMA checklist and include a PRISMA flow diagram as a figure in the manuscript (9). CONSORT and PRISMA checklists can be uploaded as supplemental material for the benefit of reviewers and editors.

Research on animals should include a statement that the protocol was approved by the appropriate committee or complied with the Guide for the Care and Use of Laboratory Animals (10). Compliance with the ARRIVE guidelines is encouraged and the checklist can be uploaded as supplemental material (11). Describe how animals were euthanized. Describe control and experimental animals or participants, giving age, weight, sex, race, and for animals, breed or strain. Include the supplier of experimental animals.

Diets. Composition of control and experimental diets must be presented. When a diet composition is published for the first time in JN, provide complete information on all components in a table. If previously described in JN or AJCN, a reference may be used. State specifically any modifications made to the published diet compositions. The proximate composition of closed formula diets should be given as amounts of protein, energy, fat, and fiber. Express components as g/kg diet. Vitamin and mineral mixture compositions should be included using JN units and nomenclature. For a discussion of the formulation of purified animal diets, refer to Baker (12) and to a series of ASN publications (13–16). The experimental diets should differ from the control diets only in the nutrient(s) being investigated. Nonpurified diets generally should not be used as control diets; animals fed these diets should be included for reference only and their data should not be included in the statistical analysis.

Statistical methods. Describe all statistical tests utilized and indicate the probability level (P) at which differences were considered significant. If data are presented in the text, state what they represent (e.g., mean ± SEM). Indicate whether data were transformed before analysis. Specify any statistical computer programs used.

Present the results of the statistical analysis of data in the body of each table and on figures per se. Use letters or symbols to indicate significant differences; define these in a table footnote or the figure legend. Provide the appropriate statistics of variability with an estimate of the error variance (SD or SEM) of group means. Standard ANOVA methodology assumes a homogeneous variance. If error variance is tested and found to be heterogeneous, transform data before ANOVA, or use nonparametric tests. For a discussion of variability calculations and curve-fitting procedures, see Baker (12).

If non-significant P values are reported, use only 2 digits past the decimal (e.g., P=0.15). Present significant P values to a maximum of 4 decimal places (e.g., P<0.0001); using fewer is acceptable. Present coefficients to a maximum of 2 decimal places (e.g., r=0.87, R²=0.16, etc.).

5. Results
Report the results of the study without repeating the methodology, Introduction, or content in the Discussion section. Do not duplicate data from tables or figures in the text.
6. Discussion
In the Discussion, explain the importance of the findings, putting them into the context of the existing literature. Clearly state the overall conclusions.

7. Acknowledgments
Technical assistance and advice may be acknowledged in a section at the end of the text. Only named individuals should be included in this section. Authors are responsible for obtaining written permission from everyone providing a personal communication or acknowledged by name in the manuscript and for providing to the Editor a copy of the permission, if requested.

Statement of authors’ contributions to manuscript. Authors must indicate their contribution(s) to the manuscript in the Acknowledgments section. Use the relevant descriptors listed below unless the author performed a function that clearly is not covered by one of these. All manuscripts, including reviews, must indicate who is responsible for design, writing, and final content and must include a statement affirming that all authors have read and approved the manuscript. The initials of all authors must be included.
1. designed research (project conception, development of overall research plan, and study oversight).
2. conducted research (hands-on conduct of the experiments and data collection).
3. provided essential reagents, or provided essential materials (applies to authors who contributed by providing animals, constructs, databases, etc., necessary for the research).
4. analyzed data or performed statistical analysis.
5. wrote paper (only authors who made a major contribution).
6. had primary responsibility for final content.
7. other (use only if categories above are not applicable; describe briefly).
8. All authors have read and approved the final manuscript. For single-authored research papers and reviews, please state: The sole author had responsibility for all parts of the manuscript.

Please do not include "obtained funding." The initials of authors who received grants may be included in the footnote on the title page regarding Support.

An example is:
A. X., R. F. G., and P. G. Y. designed research; R. F. G. and Q. C. conducted research; P. T. analyzed data; and A. X., P. G. Y. and Q. C. wrote the paper. P. G. Y. had primary responsibility for final content. All authors read and approved the final manuscript.

8. References
Consecutively number references, including web citations, in the order in which they are first mentioned in the text. Number references cited for the first time in tables or figure legends in order, based on the first citation of the table or figure in the text. Identify references in the text, tables, and legends for figures by Arabic numbers in parentheses.

Only published papers and accepted papers that are "in press" may be included in the References section. "In press" papers must be submitted as supplemental files in PDF format at the time of manuscript submission. Personal communications from others and unpublished data of the authors, including submitted manuscripts, should appear parenthetically in the text. Include the full name and affiliation of the person providing a personal communication.

JN reference format is consistent with the International Committee of Medical Journal Editors (ICMJE) recommended format for bibliographic citations (17) with the following exception: list the names of all authors, unless there are more than ten, in which case list the first ten plus "et al." The ICMJE states, "as an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted." JN follows this optional style. If you are using software such as EndNote or Reference Manager that inserts this additional material, it will be automatically deleted during production of accepted manuscripts.

Abbreviate journal names according to the National Library of Medicine (NLM) journal abbreviations list (18). Authors may add to a reference, the DOI ("digital object identifier" number unique to the publication) for articles in press it should be included immediately after the citation in the References. An example is:

Examples of citations to sources on the internet and to books can be found in the References in JN Instructions for Authors (page 13). Monographs can be cited in the following format:

There is no limit on the number of citations allowed; cite recent literature comprehensively. Begin the list of references on a new page. Note that there should be no line numbers on the row with the “References” heading or throughout the References section.

Units of Measure
Metric units are required (e.g., m, kg, and L for height, weight, and volume, respectively), as is the Celsius scale (°C). For reporting data, use of SI units (le Systeme Internationale d’Unites) (19) is preferred (e.g., mmol/L, mmol/L...
g/L) but not mandatory. Conventional units such as mg/dL and mg/mL are acceptable, using L, not l, for liter. Use units for the same analyte/compound consistently throughout the manuscript. Placing an alternate unit parenthetically in the text or giving conversion factors in table footnotes or figure legends is acceptable. Units should not be pluralized (e.g., wk, not wks) or followed by a period.

**Useful websites are:**
- Clinical SI conversions: [http://dwjay.tripod.com/conversion.html](http://dwjay.tripod.com/conversion.html)

**Significant Digits**

The number of significant figures presented for a variable should be correct and consistent. Use no more than 3 significant figures (fewer, if appropriate) or justify the greater precision.

Base the number on the precision of the analytical method and round accordingly. In some cases, change the submultiple; e.g. change 1038 mg/d to 1.04 g/d.

Five rules govern significant figures (20):
1. Non-zero digits are always significant; 1.121 has four significant digits.
2. Any zeros between two significant digits are significant; 1.08701 has six significant digits.
3. Zeros before the digits are placeholders and not significant; in the number 0.00254, only the 2, 5, and 4 are significant, meaning the number has 3 significant digits.
4. Zeros after the decimal point and after figures are significant; in the number 0.2540, the 2, 4, 5, and last 0 are significant digits. Exponential digits in scientific notation are not significant; 1.12x10^5 has three significant digits, 1, 1, and 2.

A tutorial on the use of significant digits is available (21).

**Abbreviations**

Use standard abbreviations in *JN* papers without definition in the text. Standard abbreviations, however, should be defined at first mention in the abstract. An abridged list is in Table 1 (22). Other common standard abbreviations are listed in Scientific Style and Format (6).

Each nonstandard (author-defined) abbreviation should be defined in the abstract and text at first mention. If three or more nonstandard abbreviations are used in the text, prepare an abbreviation footnote. The footnote should be associated with the first abbreviated term in the text and should be an alphabetized listing of all author-defined abbreviations and their definitions. Group designations should be defined parenthetically at first mention [for example, “control (CON) and high-fat (HF) groups”] and included in the abbreviation footnote. Abbreviations (other than units such as min, h, m, kg) should be pluralized where appropriate (e.g., The n-3 PUFAs are...) but should not be followed by a period. Use the standard abbreviations for SI prefixes found in Young (19) and in Table 2 and those for units of measure in Table 3 (23).

All nonstandard abbreviations, including group or treatment designations, used in a table or table title must be defined alphabetically in a footnote to the table title. If the footnote to the table title contains multiple items, the definitions of the abbreviations should be the last item. If a table contains only one abbreviated term in the body of the table, then a separate footnote placed after that abbreviation should be used to define that term. Similarly, all nonstandard abbreviations, including group or treatment designations, used in a figure or figure legend must be defined alphabetically at the end of the figure legend.

**Genes and Proteins**

Full gene names are not required for tables and figures in which a database identifier number is given. A full citation to the database used should be in the References and the sequential reference number to the citation provided in the text, figure legend, or table footnote. If the genes are listed in online supporting material (OSM, supplemental tables and figures), the citation can be given as a table footnote or in the figure legend [e.g., National Center for Biotechnology Information (NCBI) Entrez Gene (24) or Unigene (25)].

All gene symbols should be italicized throughout the text, tables, and figures. The use of prefixes to designate species is not allowed. For rodent genes, the first letter should be uppercaspic with the rest in lowercase letters (e.g., for PPARγ, Pparg). For human genes, all letters should be uppercaspic (e.g., PPARG). Messenger RNA (mRNA) and complementary DNA (cDNA) use the same gene symbol and formatting conventions. Protein designations are the same as the gene symbols, are in all uppercase letters (even rodents), and are not italicized (e.g., PPARG). For the genes of other species, follow the convention for abbreviating human gene and protein names. Further information on gene and protein nomenclature rules can be found as indicated in the list below.

- **Human:** HUGO Gene Nomenclature Committee (HGNC) (26)
- **Mouse:** Mouse Genome Nomenclature Committee (MGNC) (27)
- **Rat:** Rat Genome and Nomenclature Committee (RGNC) (28)
- **Bovine:** Bovine Genome Database (BGD) (29)
- **Chicken and other avians:** Chicken Gene Nomenclature Committee (CGNC) (30)
Nomenclature

Chemical and biochemical terms and abbreviations and identification of enzymes generally should conform to the recommended usage of the International Union of Biochemistry and Molecular Biology (34). Names for vitamins, related compounds, and abbreviations for amino acids should follow the ASN nomenclature policy (35, 36).

For fatty acids, use the o or n system consistently with a colon to separate the chain length and number of bonds (e.g., 18:2n–6, 20:5n–3, 18:2o-6, 20:5o-3). In the text, refer to n–3 fatty acids, ω3 PUFA, the ratio of n–3/n–6 fatty acids, etc. Regardless of which system is used in the text, include the alternative form in parentheses in the abstract. Use common names and systematic names together at first mention. Where one-to-one human orthology cannot be established, an unofficial gene symbol can be used if it is supported by a previous literature assignment. Clade-specific or species-specific genes will be designated with an official gene symbol upon completion of the genome.

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