

**British Journal of Nutrition**  
**Volume 103, 2010 ISSN: 0007-1145**

**Publishing, Production, Marketing, and Subscription Sales Office:**

Cambridge University Press  
The Edinburgh Building  
Shaftesbury Road  
Cambridge CB2 8RU, UK

**For Customers in North America:**

Cambridge University Press  
Journals Fulfillment Department  
100 Brook Hill Drive  
West Nyack  
New York 10994-2133  
USA

**Publisher:** Katy Christomanou

**Special sales and supplements:**

This Journal accepts relevant advertisements and inserts. We also provide bulk reprints of suitable papers to meet teaching or promotional requirements. The journal also publishes supplements on behalf of academic and corporate collaborators. Please contact Katy Christomanou at the Cambridge address for further details. E-mail: kchristomanou@cambridge.org

**Subscription information:**

*British Journal of Nutrition* is an international journal published by Cambridge University Press on behalf of The Nutrition Society. The twelve issues starting January 2010 comprise Volume 103, the twelve issues starting July 2010 comprise Volume 104.

**Annual subscription rates:**

Volumes 103/104 (24 issues):  
Internet/print package £954/\$1860/€1528  
Internet only: £803/\$1566/€1283  
Print only: £909/\$1772/€1477

Any **supplements** to this journal published in the course of the annual volume are normally supplied to subscribers at no extra charge.

**Back volumes** are available. Please contact Cambridge University Press for further information.

**Claims** for non-receipt of journal issues will be considered on their merit and only if the claim is received within six months of publication. Replacement copies supplied after this date will be chargeable.

**US POSTMASTERS:** please send address corrections to *British Journal of Nutrition*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994-2133.

**Directions to Contributors** are available from the Society at the address below or can be found on the Society's website at <http://www.nutrition society.org> (an abbreviated Notes for Authors can be found inside the back cover).

**Offprints:** The author (or main author) of an accepted paper will receive a copy of the PDF file and a voucher copy of the issue in which their paper has been published. There will be an option to purchase paper offprints, these should be ordered at proof stage. No page charges are levied by this journal.

**Copyright:** As of 1 July 2000 the copyright of all articles submitted to *British Journal of Nutrition* are retained by the authors or their institutions. For articles prior to this date permission for reproduction of any part of the journal (text, figures, tables or other matter) in any form (on paper, microfiche or electronically) should be sought directly from the Society, at: The Publications Office, The Nutrition Society, 10 Cambridge Court, 210 Shepherds Bush Road, Hammersmith, London W6 7NJ, UK.

**Disclaimer:** The information contained herein, including any expression of opinion and any projection or forecast, has been obtained from or is based upon sources believed by us to be reliable, but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk. Neither the Society nor Cambridge University Press accepts responsibility for any trade advertisement included in this publication.

This journal is printed on acid-free paper from renewable sources. Printed in the UK by Bell & Bain Ltd., Glasgow.

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see [www.fsc.org](http://www.fsc.org) for information.

*British Journal of Nutrition* is covered in Current Contents®/Agriculture, Biology & Environmental Sciences, SciSearch®, Research Alert®, Current Contents®/Life Sciences, Index Medicus® (MEDLINE®), AGRICOLA®, CAB Abstracts™, Global Health, BIOSIS® Database, EMBASE/Excerpta Medica and Elsevier BIOBASE/Current Awareness in Biological Sciences, CINAHL, and Chemical Abstracts Service.

CAMBRIDGE

JOURNALS



# Nutrition Research Reviews

Published on behalf of The Nutrition Society

**Nutrition Research Reviews**

is available online at:  
<http://journals.cambridge.org/nrr>

**To subscribe contact  
Customer Services**

**in Cambridge:**

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**

Phone +1 (845) 353 7500  
Fax +1 (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor-in-chief**

K. Younger, Dublin Institute of Technology, Ireland

*Nutrition Research Reviews* presents up-to-date, concise, critical reviews of key topics in nutritional science in order to advance new concepts and hypotheses. The journal encourages the exchange of fundamental ideas on nutritional well-being in both humans and animals.

**Price information is available at:**  
<http://journals.cambridge.org/nrr>

**Free email alerts**

Keep up-to-date with new material – sign up at  
<http://journals.cambridge.org/alerts>

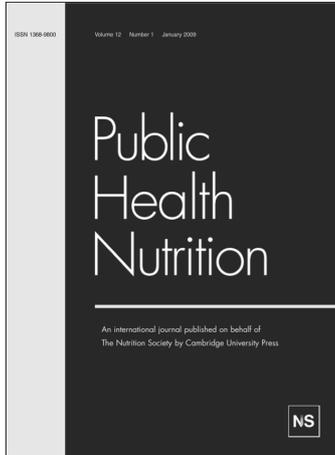
**For free online content visit:**  
<http://journals.cambridge.org/nrr>



**CAMBRIDGE  
UNIVERSITY PRESS**

CAMBRIDGE

JOURNALS



# Public Health Nutrition

Published on behalf of The Nutrition Society

**Public Health Nutrition**

is available online at:  
<http://journals.cambridge.org/phn>

**To subscribe contact  
Customer Services**

**in Cambridge:**  
Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**  
Phone +1 (845) 353 7500  
Fax +1 (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor-in-Chief**

Agneta Yngve, Karolinska Institutet, Sweden

*Public Health Nutrition* provides an international peer-reviewed forum for the publication and dissemination of research and scholarship aimed at understanding the causes of, and approaches and solutions to nutrition-related public health achievements, situations and problems around the world. The journal publishes original and commissioned articles, commentaries and discussion papers for debate.

**Price information is available at:**  
<http://journals.cambridge.org/phn>

**Free email alerts**  
Keep up-to-date with new material – sign up at  
<http://journals.cambridge.org/alerts>

**For free online content visit:**  
<http://journals.cambridge.org/phn>



**CAMBRIDGE  
UNIVERSITY PRESS**

CAMBRIDGE

JOURNALS



# Proceedings of the Nutrition Society

Published on behalf of The Nutrition Society

**Proceedings of the Nutrition Society** is available online at:  
<http://journals.cambridge.org/pns>

**To subscribe contact Customer Services**

**in Cambridge:**  
Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

**in New York:**  
Phone +1 (845) 353 7500  
Fax +1 (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

**Editor-in-Chief**

K.R. Westerterp, Maastricht University, The Netherlands

*Proceedings of the Nutrition Society* publishes papers and abstracts presented by members and invited speakers at the scientific meetings of The Nutrition Society. The journal provides an invaluable record of the scientific research currently being undertaken, contributing to 'the scientific study of nutrition and its application to the maintenance of human and animal health.'

**Price information is available at:**  
<http://journals.cambridge.org/pns>

**Free email alerts**  
Keep up-to-date with new material – sign up at  
<http://journals.cambridge.org/alerts>

**For free online content visit:**  
<http://journals.cambridge.org/pns>



**CAMBRIDGE UNIVERSITY PRESS**

(Contents continued from back cover)

Maternal dietary patterns in pregnancy and the association with small-for-gestational-age infants. <i>J. M. D. Thompson, C. Wall, D. M. O. Becroft, E. Robinson, C. J. Wild &amp; E. A. Mitchell</i>	1665–1673
<b>Behaviour, Appetite and Obesity</b>	
Effects of dietary extra-virgin olive oil on behaviour and brain biochemical parameters in ageing rats. <i>V. Pitozzi, M. Jacomelli, M. Zaid, C. Luceri, E. Bigagli, M. Lodovici, C. Ghelardini, E. Vivoli, M. Norcini, M. Gianfriddo, S. Esposito, M. Servili, G. Morozzi, E. Baldi, C. Bucherelli, P. Dolara &amp; L. Giovannelli</i>	1674–1683
<b>Workshop Report</b>	
UK Food Standards Agency Workshop Report: Diet and Immune Function. <i>P. Sanderson, R. L. Elsom, V. Kirkpatrick, P. C. Calder, J. V. Woodside, E. A. Williams, L. Rink, S. Fairweather-Tait, K. Ivory, M. Cantorna, B. Watzl &amp; E. M. Stone</i>	1684–1687
UK Food Standards Agency Workshop Report: carbohydrate and cardiovascular risk. <i>E. Peacock, J. Stanley, P. C. Calder, S. A. Jebb, F. Thies, C. J. Seal, J. V. Woodside &amp; T. A. B. Sanders</i>	1688–1694
<b>Letter to the Editor</b>	
Another approach to estimating the reliability of the glycaemic index: a different interpretation. <i>T. M. S. Wolever</i>	1695–1696
Another approach to estimating the reliability of the glycaemic index: a different interpretation – response by Williams <i>et al.</i> <i>S. M. Williams, B. J. Venn, T. Perry, R. Brown, J. I. Mann &amp; T. J. Green</i>	1697

# British Journal of Nutrition

## Directions to Contributors - Concise Version

(Revised August 2007)

The *British Journal of Nutrition* is an international peer-reviewed journal that publishes original papers, review articles, technical notes and short communications in English in all branches of nutritional science. **Prospective authors should note that they (or their institutions) now retain the copyright of their material published in the *British Journal of Nutrition*.** As a contributor you are asked to follow the guidelines set out below. For detailed information on the presentation of the technical content of your paper please see the full version of the **Directions to Contributors**, which can be downloaded from the Nutrition Society website (<http://www.nutrition-society.org>). Prospective authors may also contact the Publications Office directly on + 44 (0)20 7605 6555 (telephone), +44 20 7602 1756 (fax), or [edoffice@nutsoc.org.uk](mailto:edoffice@nutsoc.org.uk) (email).

**Papers should be accompanied by a statement to the effect that the conditions laid down in the full Directions to Contributors are accepted. The statement should affirm that the submission represents original work that has not been published previously and which is not currently being considered by another journal. It should also confirm that each author has seen and approved the contents of the submitted paper. At the time of acceptance the authors should provide a completed copy of the 'Licence to Publish' (in lieu of copyright transfer). The Licence to Publish is available on the Nutrition Society website (<http://www.nutrition-society.org>). All relevant financial interests should be declared.**

**Text.** Papers should be submitted with 1.5 line spacing and margins of at least 2 cm on each side. Text should be printed without underlining, bold or italics (except for scientific names). Standard abbreviations (e.g. Fig. and Figs.) and SI units should be used. **Typescripts can be submitted as Word, WordPerfect, EPS, Text, Postscript or RTF files. A Word processing format is required for production purposes once papers have been accepted. When substantial revisions are required to typescripts, authors are given the opportunity to do this once only, the need for any further changes should at most reflect any minor issues.**

**Title Page.** The first page should include a concise, informative title together with the names and addresses of the authors. A contact name for correspondence should be given and telephone, fax and email addresses provided. Authors should supply three or four key words or phrases (each containing up to three words). A short title of up to 45 characters is required as a running head.

**Abstract.** Each paper should commence with an accurate and informative abstract, written as a single paragraph. It should be complete in itself and intelligible without reference to the text or figures, and should not exceed 250 words.

**Tables.** Tables should be reduced to the simplest form, and should not duplicate information in the text or figures. They should be typed on separate pages, one page for each Table, at the end of the article and carry headings describing their content.

**Illustrations.** The original illustrations should accompany the submitted typescript. Text figures, line drawings, computer-generated figures and graphs should be of sufficient size and quality to allow for reduction by half or two-thirds. Half-tone photographs are acceptable where they clearly contribute to the text. All figures should be numbered and legends should be provided.

Note that authors will be charged 350 GBP for the publication of colour figures. Authors from countries entitled to free journal access through HINARI will be exempt from these charges.

**References.** References should be based on the numbered (Vancouver) system. **When an article has more than ten authors, only the names of the first three should be given followed by *et al.*; give abbreviated journal titles and conform to the following styles:**

- Goel V, Cheema SK, Agellon LB, Ooraikul B & Basu TK (1999) Dietary rhabarb (*Rheum rhabarbarum*) stalk fibre stimulates cholesterol 7 $\alpha$ -hydroxylase gene expression and bile acid excretion in cholesterol-fed C57BL/6J mice. *Br J Nutr* **81**, 65–71.
- Jenkins DJ, Kendall CW, Marchie A, *et al.* (2003) The effect of combining plant sterols, soy protein, viscous fibres, and almonds in treating hypercholesterolemia. *Metabolism* **52**, 1478–1483.
- Brandtzaeg P (2003) Role of local immunity and breast-feeding in mucosal homeostasis and defence against infections. In *Nutrition and Immune Function*, pp. 273–320 [PC Calder, CJ Field and HS Gill, editors]. Wallingford, Oxon: CAB International.
- Stock M & Rothwell NJ (1982) *Obesity and Leanness: Basic Aspects*. London: John Libbey.

Citations should be numbered consecutively in the order in which they first appear in the text using superscript Arabic numerals in parentheses, e.g. 'The conceptual difficulty of this approach has recently been highlighted<sup>(1,2-4)</sup>. If a reference is cited more than once the same number should be used each time.

**Referees.** Authors are asked to submit the names of up to four scientists who would be well-qualified to review the paper; however, no more than one such reviewer will be used. The email addresses and institutions of the named reviewers should be given.

**Proofs.** PDF page proofs will be emailed to authors for checking, and should be returned within 3 days (by fax or Express mail) to the BJN Production Editor, Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, UK; fax +44 1223 325802, email [bjnproduction@cambridge.org](mailto:bjnproduction@cambridge.org)

**Typescripts.** The *British Journal of Nutrition* operates an on-line submission and reviewing system (eJournalPress). **Authors should submit to the following address:** <http://bjn.msubmit.net/> If any difficulties are encountered please contact the Publications Office (details above) immediately.

Professor Philip Calder  
Editor-in-Chief  
British Journal of Nutrition  
The Nutrition Society  
10 Cambridge Court  
210 Shepherds Bush Road  
London W6 7NJ  
UK

Tel: +44 (0)20 7605 6555  
Fax: +44 20 7602 1756  
Email: [edoffice@nutsoc.org.uk](mailto:edoffice@nutsoc.org.uk)

**Contents**

**Review Article**

- Curcumin as a therapeutic agent: the evidence from *in vitro*, animal and human studies.  
*J. Epstein, I. R. Sanderson & T. T. MacDonald* 1545–1557
- High dietary intake of prebiotic inulin-type fructans in the prehistoric Chihuahuan Desert.  
*J. D. Leach & K. D. Sobolik* 1558–1561
- Does stress induce salt intake?  
*S. J. Torres, A. I. Turner & C. A. Nowson* 1562–1568

**Short Communication**

- Absorption of red clover isoflavones in human subjects: results from a pilot study.  
*R. Maul & S. E. Kulling* 1569–1572
- Protection by dietary *Spirulina platensis* against D-galactosamine- and acetaminophen-induced liver injuries.  
*J. Lu, D.-F. Ren, J.-Z. Wang, H. Sanada & Y. Egashira* 1573–1576

**Molecular Nutrition**

- Effect of prebiotic fibre supplementation on hepatic gene expression and serum lipids: a dose-response study in JCR:LA-cp rats.  
*J. A. Parnell & R. A. Reimer* 1577–1584
- Inter-individual variation in DNA damage and base excision repair in young, healthy non-smokers: effects of dietary supplementation and genotype.  
*F. Caple, E. A. Williams, A. Spiers, J. Tyson, B. Burtle, A. K. Daly, J. C. Mathers & J. E. Hesketh* 1585–1593
- Small quantities of carotenoid-rich tropical green leafy vegetables indigenous to Africa maintain vitamin A status in Mongolian gerbils (*Meriones unguiculatus*).  
*R. A. Ejoh, J. T. Dever, J. P. Mills & S. A. Tanumihardjo* 1594–1601

**Metabolism and Metabolic Studies**

- Absorption, conjugation and excretion of the flavanones, naringenin and hesperetin from  $\alpha$ -rhamnosidase-treated orange juice in human subjects.  
*L. Bredsdorff, I. L. F. Nielsen, S. E. Rasmussen, C. Cornett, D. Barron, F. Bouisset, E. Offord & G. Williamson* 1602–1609

**Nutritional Endocrinology**

- Postprandial response of plasma insulin, amylin and acylated ghrelin to various test meals in lean and obese cats.  
*L. J. M. Martin, B. Siliart, T. A. Lutz, V. Biourge, P. Nguyen & H. J. W. Dumon* 1610–1619

**Nutritional Immunology**

- Probiotic attributes of *Lactobacillus* strains isolated from food and of human origin.  
*S. B. Gaudana, A. S. Dhanani & T. Bagchi* 1620–1628

**Human and Clinical Nutrition**

- Homocysteine-lowering vitamins do not lower plasma S-adenosylhomocysteine in older people with elevated homocysteine concentrations.  
*T. J. Green, C. M. Skeaff, J. A. McMahon, B. J. Venn, S. M. Williams, A. M. Devlin & S. M. Innis* 1629–1634
- Combining enteral with parenteral nutrition to improve postoperative glucose control.  
*P. Lidder, D. Flanagan, S. Fleming, M. Russell, N. Morgan, T. Wheatley, J. Rahamin, S. Shaw & S. Lewis* 1635–1641
- Glycaemic index of Indian flatbreads (rotis) prepared using whole wheat flour and 'atta mix'-added whole wheat flour.  
*G. Radhika, C. Sumathi, A. Ganesan, V. Sudha, C. J. K. Henry & V. Mohan* 1642–1647
- Influence of fish oil or folate supplementation on the time course of plasma redox markers during pregnancy.  
*C. Franke, H. Demmelmair, T. Decsi, C. Campoy, M. Cruz, J. A. Molina-Font, K. Mueller & B. Koletzko* 1648–1656

**Dietary Surveys and Nutritional Epidemiology**

- Adherence to the Mediterranean dietary pattern among Balearic Islands adolescents.  
*E. Martínez, R. Llull, M. del Mar Bibiloni, A. Pons & J. A. Tur* 1657–1664

(Contents continued facing inside back cover)