Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a

Directions to Contributors can be found at journals.cambridge.org/bjn

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 Sarah Maddox at the Cambridge address for further details. E-mail: special_sales@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 2014 comprise Volume 111, the twelve issues starting July 2014 comprise Volume 112.

Annual subscription rates:

Volume 111/112 (24 issues)
Internet/print package £1432/$2792/€2294
Internet only: £1023/$1994/€1634
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.nutritionssociety.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 of their article. There will be an option to purchase paper offprints which will 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 journal. This journal is printed on acid-free paper from renewable sources. Printed in the UK by Bell & Bain Ltd., Glasgow. This journal has been issued 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 for information.

British Journal of Nutrition, published by Cambridge University Press on behalf of the Nutrition Society 2014

British Journal of Nutrition
Volume 112, 2014 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 Office
100 Brook Hill Drive
West Nyack
New York 10994-2133

USA

Publisher: Katy Christomanou

Editor-in-Chief
C G Burridge, Southampton, UK

Deputy Editors
A E Buyken, Dortmund, Germany
J L Finkus, Columbus, OH, USA
D N Murray, College Station, TX, USA
A M Minihane, Norwich, UK
M Y D He, Aberdeen, UK
A J Sinclair, Barwon, Australia
M B Schulze, Potsdam-Briebrode, Germany
B J Whiting, St Helens, UK, Canada

Reviews Editors
P J Aagot, Lund, UK
D J Millward, Guildford, UK

Supplements Editor
J V Woodside, Belfast, UK

Editors
M Ho, Brux, NV, USA
C Meyze, Aberdeen, UK
I Saunders, Glen Osmond, Australia
N St-Pierre, Columbus, OH, USA

The British Journal of Nutrition is an international, peer-reviewed journal publishing original papers, review articles, short communications and technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material from all of the specialties involved in research and clinical practice. The Journal also publishes supplements on topics of particular interest.

The British Journal of Nutrition is published twice monthly by Cambridge University Press on behalf of The Nutrition Society. The British Journal of Nutrition is available online to subscribers at journals.cambridge.org/bjn

Tables of contents and abstracts are available free at the same site.

British Journal of Nutrition
An International Journal of Nutritional Science
Volume 112, 2014 ISSN: 0007-1145

Aims and Scope

The British Journal of Nutrition is an international, peer-reviewed journal publishing original papers, review articles, short communications and technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material from all of the specialties involved in research and clinical practice. The Journal also publishes supplements on topics of particular interest.

The British Journal of Nutrition is published twice monthly by Cambridge University Press on behalf of The Nutrition Society. The British Journal of Nutrition is available online to subscribers at journals.cambridge.org/bjn

Tables of contents and abstracts are available free at the same site.

Editor-in-Chief
C G Burridge, Southampton, UK

Deputy Editors
A E Buyken, Dortmund, Germany
J L Finkus, Columbus, OH, USA
D N Murray, College Station, TX, USA
A M Minihane, Norwich, UK
M Y D He, Aberdeen, UK
A J Sinclair, Barwon, Australia
M B Schulze, Potsdam-Briebrode, Germany
B J Whiting, St Helens, UK, Canada

Reviews Editors
P J Aagot, Lund, UK
D J Millward, Guildford, UK

Supplements Editor
J V Woodside, Belfast, UK

Editors
M Ho, Brux, NV, USA
C Meyze, Aberdeen, UK
I Saunders, Glen Osmond, Australia
N St-Pierre, Columbus, OH, USA

The British Journal of Nutrition is an international, peer-reviewed journal publishing original papers, review articles, short communications and technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material from all of the specialties involved in research and clinical practice. The Journal also publishes supplements on topics of particular interest.

The British Journal of Nutrition is published twice monthly by Cambridge University Press on behalf of The Nutrition Society. The British Journal of Nutrition is available online to subscribers at journals.cambridge.org/bjn

Tables of contents and abstracts are available free at the same site.

Editor-in-Chief
C G Burridge, Southampton, UK

Deputy Editors
A E Buyken, Dortmund, Germany
J L Finkus, Columbus, OH, USA
D N Murray, College Station, TX, USA
A M Minihane, Norwich, UK
M Y D He, Aberdeen, UK
A J Sinclair, Barwon, Australia
M B Schulze, Potsdam-Briebrode, Germany
B J Whiting, St Helens, UK, Canada

Reviews Editors
P J Aagot, Lund, UK
D J Millward, Guildford, UK

Supplements Editor
J V Woodside, Belfast, UK

Editors
M Ho, Brux, NV, USA
C Meyze, Aberdeen, UK
I Saunders, Glen Osmond, Australia
N St-Pierre, Columbus, OH, USA

The British Journal of Nutrition is an international, peer-reviewed journal publishing original papers, review articles, short communications and technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material from all of the specialties involved in research and clinical practice. The Journal also publishes supplements on topics of particular interest.

The British Journal of Nutrition is published twice monthly by Cambridge University Press on behalf of The Nutrition Society. The British Journal of Nutrition is available online to subscribers at journals.cambridge.org/bjn

Tables of contents and abstracts are available free at the same site.

Editor-in-Chief
C G Burridge, Southampton, UK

Deputy Editors
A E Buyken, Dortmund, Germany
J L Finkus, Columbus, OH, USA
D N Murray, College Station, TX, USA
A M Minihane, Norwich, UK
M Y D He, Aberdeen, UK
A J Sinclair, Barwon, Australia
M B Schulze, Potsdam-Briebrode, Germany
B J Whiting, St Helens, UK, Canada

Reviews Editors
P J Aagot, Lund, UK
D J Millward, Guildford, UK

Supplements Editor
J V Woodside, Belfast, UK

Editors
M Ho, Brux, NV, USA
C Meyze, Aberdeen, UK
I Saunders, Glen Osmond, Australia
N St-Pierre, Columbus, OH, USA

The British Journal of Nutrition is an international, peer-reviewed journal publishing original papers, review articles, short communications and technical notes on human and clinical nutrition, animal nutrition and basic science as applied to nutrition. Correspondence is encouraged in a Nutrition Discussion Forum. The Journal recognizes the multidisciplinary nature of nutritional science and encourages the submission of material from all of the specialties involved in research and clinical practice. The Journal also publishes supplements on topics of particular interest.

The British Journal of Nutrition is published twice monthly by Cambridge University Press on behalf of The Nutrition Society. The British Journal of Nutrition is available online to subscribers at journals.cambridge.org/bjn

Tables of contents and abstracts are available free at the same site.