

NEW!

# Achieving sustainable production of milk

VOLUMES 1, 2 & 3

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IN AGRICULTURAL SCIENCE

## Volume 1

Edited by: Nico van Belzen, Director General of the International Dairy Federation (IDF), Belgium

- Summarises latest research on the composition of proteins and other components in milk
- Reviews advances in understanding factors affecting milk quality eg. breeding and nutrition
- Discusses current research on genetic factors affecting dairy cattle growth and health as well as ways to optimise breeding to improve the productivity of dairy cows

## Volume 2

Edited by: Nico van Belzen, Director General of the International Dairy Federation (IDF), Belgium

- Summarises current research on pathogenic risks affecting milk and ways they can be controlled on the farm
- Reviews ways of measuring and reducing the environmental impact of dairy farming such as better grassland management
- Assesses the wider role of dairy farming and how it can be improved in the developing world

"As demand for dairy products continues to grow, and with sustainable nutrition and food security at the top of the global agenda, it is imperative that we develop and share the latest knowledge, practices and issues relating to sustainability of dairy chains. With a veritable Who's Who of dairy expertise and an expert editor in IDF Director General Nico van Belzen, Achieving sustainable production of milk will go a long way to achieving this."

*Dr Jeremy Hill, President - IDF/Chief Technology Officer - Fonterra Co-operative Group Ltd*



## Volume 3

Edited by: John Webster, University of Bristol, UK

- Reviews advances in understanding and improving the welfare of dairy cattle
- Summarises current research on rumen biology, digestion and ways of optimising nutrition of dairy cattle from grazing to feed and feed supplements
- Discusses latest developments in maintaining the health of dairy cattle, including the genetics of disease resistance and dairy herd health management

## Achieving sustainable production of milk - Vol.1

### Milk composition, genetics and breeding

Edited by: Nico van Belzen, Director General of the International Dairy Federation (IDF), Belgium

#### Part 1 The composition and quality of milk

1. The proteins of milk: *Shane V. Crowley, James A. O' Mahony and Patrick F. Fox, University College Cork, Ireland*
2. Bioactive components in cow's milk: *Young W. Park, Fort Valley State University, USA*
3. Ingredients from milk for use in food and non-food products: from commodity to value-added ingredients: *Thom Huppertz and Inge Gazi, NIZO food research, The Netherlands*
4. Understanding and preventing spoilage of cow's milk: *G. LaPointe, University of Guelph, Canada*
5. Sensory evaluation of cow's milk: *Stephanie Clark, Iowa State University, USA*

#### Part 2 Genetics, breeding and other factors affecting quality and sustainability

6. Using genetic selection in the breeding of dairy cattle: *Julius van der Werf, University of New England, Australia and Jennie Pryce, Department of Economic Development, Jobs, Transport and Resources (Government of Victoria) and La Trobe University, Australia*
7. Genetic factors affecting fertility, growth, health and longevity in dairy cattle: *Joel Ira Weller, Agricultural Research Organization, The Volcani Center, Israel*

8. Breeding and management strategies to improve reproductive efficiency in dairy cattle: *D. J. Ambrose, Alberta Agriculture and Forestry, University of Alberta, Canada and J. P. Kastelic, University of Calgary, Canada*
9. Nutritional strategies to improve nitrogen efficiency and milk protein synthesis in dairy cows: *James D. Ferguson, University of Pennsylvania, USA*



#### BOOK REVIEW - VOLUME 1 & 2

**"Edited by the Director General of the International Dairy Federation, Dr Nico van Belzen, there can be little doubt regarding the scientific quality and likely impact of these volumes... I hope that the books/chapters will find a large audience and, by doing so, help to achieve the sustainability of milk production that the title promises"**

*Journal of Dairy Research*

## Achieving sustainable production of milk - Vol.2

### Safety, quality and sustainability

Edited by: Nico van Belzen, Director General of the International Dairy Federation (IDF), Belgium

#### Part 1 Ensuring the safety and quality of milk on the farm

1. Pathogens affecting raw milk from cows: *Claire Verraes, Sabine Cardoen and Wendie Claeys, Federal Agency for the Safety of the Food Chain; and Lieve Herman, Institute for Agricultural and Fisheries Research, Belgium*
2. Detecting pathogens in milk on dairy farms: key issues for developing countries: *Delia Grace, Silvia Alonso, Johanna Lindahl, Sara Ahlberg and Ram Pratim Deka, International Livestock Research Institute (ILRI), Kenya*
3. Mastitis, milk quality and yield: *P. Moroni, Cornell University, USA and University of Milano, Italy; F. Welcome, Cornell University, USA; and M. F. Addis, Porto Conte Ricerche, Italy*
4. Chemical contaminants in milk: *Bernadette O'Brien and Kieran Jordan, Teagasc, Ireland*
5. Detecting and preventing contamination of dairy cattle feed: *Delia Grace, International Livestock Research Institute (ILRI), Kenya; Johanna Lindahl, International Livestock Research Institute (ILRI), Kenya and Swedish University of Agricultural Sciences, Sweden; Erastus Kang'ethe, University of Nairobi, Kenya; and Jagger Harvey, Biosciences Eastern and Central Africa Hub, International Livestock Research Institute (ILRI), Kenya; Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss, Kansas State University, USA*
6. Minimising the development of antimicrobial resistance on dairy farms: appropriate use of antibiotics for the treatment of mastitis: *Pamela L. Ruegg, University of Wisconsin-Madison, USA*
7. Managing sustainable food safety on dairy farms: *Réjean Bouchard, VIDO-InterVac/University of Saskatchewan, Canada; Helen Dornom, Dairy Australia, Australia; Anne-Charlotte Dockès, Institut de l'Élevage, France; Nicole Sillett, Dairy Farmers of Canada, Canada; and Jamie Jonker, National Milk Producers Federation, USA*

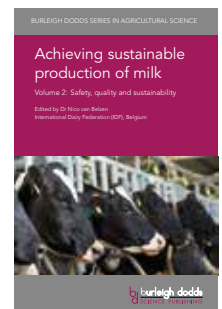
#### Part 2 Sustainability

8. 'Towards' sustainability of dairy farming: an overview: *Norman R. Scott and Curt Gooch, Cornell University, USA*
9. Setting environmental targets for dairy farming: *Sophie Bertrand, French Dairy Inter-branch Organization, France*

10. Grassland management to minimize the environmental impact of dairy farming: *Margaret E. Graves, Dalhousie University, Canada; and Ralph C. Martin, University of Guelph, Canada*
11. Improved energy and water management to minimize the environmental impact of dairy farming: *J. Upton, E. Murphy and L. Shalloo, Teagasc, Ireland; M. Murphy, Cork Institute of Technology, Ireland; and I.J.M. De Boer and P.W.G. Groot Koerkamp, Wageningen University, The Netherlands*
12. Ensuring biodiversity in dairy farming: *Ben Tyson, Central Connecticut State University, USA; Liza Storey and Nick Edgar, New Zealand Landcare Trust, New Zealand; Jonathan Draper, Central Connecticut State University, USA; and Christine Unson, Southern Connecticut State University, USA*
13. Organic dairy farming and sustainability: *Florian Leiber, Adrian Muller, Veronika Maurer, Christian Schader and Anna Bieber, Research Institute of Organic Agriculture (FiBL), Switzerland*
14. Trends in dairy farming and milk production: the cases of the United Kingdom and New Zealand *Alison Bailey, Lincoln University, New Zealand*
15. Assessing the overall impact of dairy farming: *J. P. Hill, Fonterra Cooperative Group, New Zealand*

#### Part 3 Improving quality, safety and sustainability in developing countries

16. Improving smallholder dairy farming in tropical Asia: *John Moran, Profitable Dairy Systems, Australia*
17. Improving smallholder dairy farming in Africa: *J. M. K. Ojango, R. Mrode, A. M. Okeyo, International Livestock Research Institute (ILRI), Kenya; J. E. O. Rege, Emerge-Africa, Kenya; M. G. G. Chagunda, Scotland's Rural College (SRUC), UK; and D. R. Kugonza, Makerere University, Uganda*
18. Organic dairy farming in developing countries: *Gidi Smolders, Wageningen University, The Netherlands; Mette Vaarst, Aarhus University, Denmark*



## Achieving sustainable production of milk - Vol.3

### Dairy herd management and welfare

Edited by: John Webster, University of Bristol, UK

#### Part 1 Welfare of dairy cattle

1. Understanding the behaviour of dairy cattle: *C. J. C. Phillips, University of Queensland, Australia*
2. Key issues in the welfare of dairy cattle: *Jan Hultgren, Swedish University of Agricultural Sciences, Sweden*
3. Housing and the welfare of dairy cattle: *Jeffrey Rushen, University of British Columbia, Canada*
4. Genetic selection for dairy cow welfare and resilience to climate change: *Jennie E. Pryce, Agriculture Victoria and La Trobe University, Australia; and Yvette de Haas, Wageningen UR, The Netherlands*
5. Ensuring the welfare of culled dairy cows during transport and slaughter: *Carmen Gallo and Ana Strappini, Animal Welfare Programme, Faculty of Veterinary Science, Universidad Austral de Chile, Chile*
6. Ensuring the health and welfare of dairy calves and heifers: *Emily Miller-Cushon, University of Florida, USA; Ken Leslie and Trevor DeVries, University of Guelph, Canada*

#### Part 2 Nutrition of dairy cattle

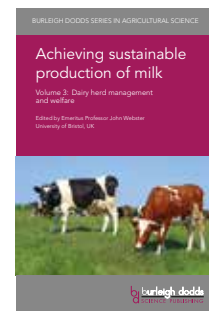
7. The rumen microbiota and its role in dairy cow production and health: *Anusha Bulumulla, Mi Zhou and Le Luo Guan, University of Alberta, Canada*
8. Biochemical and physiological determinants of feed efficiency in dairy cattle: *John McNamara, Washington State University, USA*
9. Feed evaluation and formulation to maximise nutritional efficiency in dairy cattle: *Pekka Huhtanen, Swedish University of Agricultural Sciences, Sweden*
10. Sustainable nutrition management of dairy cattle in intensive systems: *Michel A. Wattiaux, Matias A. Aguerre and Sanjeewa D. Ranathunga, University of Wisconsin-Madison, USA*
11. Nutrition management of grazing dairy cows in temperate environments: *J. R. Roche, DairyNZ, New Zealand*
12. The use and abuse of cereals, legumes and crop residues in rations for dairy cattle: *Michael Blümmel, International Livestock Research Institute (ILRI), Ethiopia; A. Muller, Research Institute of Organic Agriculture (FiBL), and ETH Zürich Switzerland; C. Schader, Research Institute of Organic Agriculture (FiBL), Switzerland; M. Herrero,*

*Commonwealth Scientific and Industrial Research Organization, Australia; and M. R. Garg, National Dairy Development Board (NDDB), India*

13. Feed supplements for dairy cattle: *C. Jamie Newbold, Aberystwyth University, UK*

#### Part 3 Health of dairy cattle

14. Disorder of digestion and metabolism in dairy cattle: the case of subacute rumen acidosis: *Gregory B. Penner, University of Saskatchewan, Canada*
15. Management of dairy cows in transition and at calving: *Kenneth Nordlund, University of Wisconsin-Madison, USA*
16. Causes, prevention and management of infertility in dairy cows: *Alexander C. O. Evans, University College Dublin, Ireland; and Shenming Zeng, China Agriculture University, China*
17. Aetiology, diagnosis and control of mastitis in dairy herds: *P. Moroni, Cornell University, USA and Università degli Studi di Milano, Italy; F. Welcome, Cornell University, USA; and M.F. Addis, Porto Conte Ricerche, Italy*
18. Preventing and managing lameness in dairy cows: *Nick Bell, The Royal Veterinary College, UK*
19. Control of infectious diseases in dairy cattle: *Wendela Wapenaar, Simon Archer and John Remnant, University of Nottingham, UK; and Alan Murphy, Minster Veterinary Practice, UK*
20. Prevention and control of parasitic helminths in dairy cattle: key issues and challenges: *Jacqueline B. Matthews, Moredun Research Institute, UK*
21. Genetic variation in immunity and disease resistance in dairy cows and other livestock: *Michael Stear, Karen Fairlie-Clarke, and Nicholas Jonsson, University of Glasgow, UK; Bonnie Mallard, University of Guelph, Canada; and David Groth, Curtin University, Australia*
22. Responsible and sustainable use of medicines in dairy herd health: *David C. Barrett, Kristen K. Reyher, Andrea Turner and David A. Tisdall, University of Bristol, UK*
23. Dairy herd health management: an overview: *Jonathan Statham, Bishopton Veterinary Group and RAFT Solutions Ltd., UK*



#### BOOK REVIEW - VOLUME 3

"...the book offers important and in-depth information on dairy cattle welfare, nutrition and health."

*International Dairy Magazine*

## Editor Biographies

### Volume 1 & 2

**Dr Nico van Belzen** is Director-General of the International Dairy Federation (IDF). He has occupied senior roles in both industry and research organisations, both as Head of the Research and Analysis department at the ingredients division of Campina and as Executive Director of the European Branch of the International Life Sciences Institute (ILSI).

### Volume 3

**Dr John Webster** is Emeritus Professor in Animal Husbandry at the University of Bristol, UK. Amongst his many achievements, Professor Webster was recently awarded an honorary degree by the Royal Veterinary College for his research in animal science, as well as the Universities Federation for Animal Welfare (UFAW) Medal for Outstanding Contributions to Animal Welfare. He established the Animal Welfare and Behaviour Group at the University of Bristol, one of the largest and most highly-regarded of its kind in the world, and was a founder member of the Farm Animal Welfare Council which pioneered the Five Freedoms for farm animals.

"There can be few people in the world better qualified to edit a new book about nutrition, health and welfare of dairy cattle than John Webster. These have been the passions of a long and distinguished academic career. He has assembled a strong team of authors to provide comprehensive coverage of key topics, as well as the wide range of dairy production systems across developed and developing countries."

*Richard Dewhurst, Professor of Ruminant Nutrition and Production Systems, SRUC, Edinburgh. UK*

## Biblio information



### Achieving sustainable production of milk - Vol 1 Milk composition, genetics and breeding

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### Achieving sustainable production of milk - Vol 2 Safety, quality and sustainability

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### Achieving sustainable production of milk - Vol 3 Dairy herd management and welfare

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