



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



# **RESHAPING AGRICULTURE FOR BETTER NUTRITION**

The agriculture, food, nutrition, health nexus

**The Crawford Fund  
2018 Annual Conference**

**Parliament House, Canberra ACT, Australia**

**13–14 August 2018**

Editor: A. Milligan

## The Crawford Fund

The Australian Academy of Technology and Engineering established the Crawford Fund in June 1987. Named in honour of the late Sir John Crawford, the Fund commemorates his outstanding services to international agricultural research.

The Crawford Fund is a non-profit, non-government organisation, dedicated to raising awareness of the benefits – to developing countries and to Australia – of international agricultural research. The Fund depends on grants and donations from governments, private companies, corporations, charitable trusts and individual Australians. It also welcomes partnerships with agencies and organisations in Australia and overseas.

The Fund promotes and supports international R&D activities in which Australian research organisations and companies are active participants. It supports the work of the Australian Government's aid program, particularly with the Australian Centre for International Agricultural Research (ACIAR), the CGIAR Consortium, and other international research centres. The Crawford Fund also runs training programs that fill a niche by offering practical, highly focused non-degree instruction to women and men engaged in agricultural research and management in developing countries.

We also support and encourage the next generation in their study and careers in international agricultural research, through our international agricultural student awards and our Crawford Fund Conference scholarships and related activities, and by providing volunteering opportunities in our mentoring program.

The annual Conference is a key part of the Fund's public awareness campaign to increase understanding of key food and nutrition security issues and the importance and potential of international agricultural research.

### The Crawford Fund

Building 7, Unit 7, 1 Dairy Road,  
Fyshwick ACT 2609, Australia

Phone: +61 (0)2 6280 8611

Email: [crawford@crawfordfund.org](mailto:crawford@crawfordfund.org)

Web: <http://www.crawfordfund.org>

Twitter: @CrawfordFund

YouTube: <https://www.youtube.com/user/CrawfordFund>

©The Crawford Fund 2018

ISBN 978-0-9953679-3-7

### *Cite this work as:*

Crawford Fund (2018). *Reshaping agriculture for better nutrition: the agriculture, food, nutrition, health nexus*. (Ed. A. Milligan.) Proceedings of the Crawford Fund 2018 Annual Conference, 13–14 August 2018, Canberra ACT, Australia.

IMAGES: The Crawford Fund; speakers' presentations;

Marchien Van Oostende (front cover main); Robyn Alders AO (back cover main)

COVER: Stacey Phillis, Graphic Force, Brisbane QLD

TRANSCRIPTIONS: TranscriberOnline, [www.transcriberonline.com](http://www.transcriberonline.com)

EDITING, PRODUCTION: ENRIT: Environment & Natural Resources in Text, Canberra ACT

PRINTING: Bytes 'n Colours, Braddon ACT, <http://bytesnocolours.com.au/>

# Contents

	Page no.
The Crawford Fund	ii
<b>Acknowledgements</b>	v
<b>Foreword</b>	vii
SIR JOHN CRAWFORD MEMORIAL ADDRESS, Monday 13 August evening	
<b>Food, climate change and national security</b>	
Frances Adamson	1
MINISTERIAL ADDRESS, Tuesday 14 August	
The Hon. Julie Bishop MP, Minister for Foreign Affairs	11
KEYNOTE: MORNING	
<b>Feeding a growing global population with healthy food from a sustainable planet</b>	
Dr Alessandro Demaio	16
SESSION 2: CHALLENGES AND IMPACTS OF POOR NUTRITION	
<b>Overview</b>	
Dr Jessica Fanzo	26
<b>Q&amp;A:</b> Dr Alessandro Demaio & Dr Jessica Fanzo. <i>Chair:</i> Dr Mario Herrero	37
SESSION 3: HOW DOES AGRICULTURE RESPOND TO THE NUTRITION CHALLENGE?	
<b>Overview</b>	
Professor Andrew Campbell	43
<i>Case study: Recognising the role of the livestock sector in human health &amp; nutrition</i>	
Dr Anna Okello	52
<i>Case study: Breaking the food-system divide with Smart Food: good for you, the planet and the farmer</i>	
Joanna Kane-Potaka	58
<i>Case study: Tapping the nutritional power of vegetables</i>	
Dr Marco Wopereis	62
<b>Q&amp;A:</b> <i>Chair:</i> Professor Maggie Gill	70
SESSION 4: DELIVERING RESULTS – POLICIES AND PRACTICES FOR CHANGE	
<b>Overview</b>	
Professor Glenn Denning	79
<i>Case study: Behavioural change for better nutrition in Papua New Guinea</i>	
Philmah Seta Waken & Tania Paul	87
<i>Case study: Nutrition-sensitive agriculture programming: addressing demand- &amp; supply-side factors in Timor-Leste</i>	
Annie Major	94
<i>Case study: Small fish, big impact: nutrition-sensitive approaches to fish agri-food systems</i>	
Dr Jessica Bogard & Dr Shamia Chowdhury	100
<i>Case study: Iron-biofortified cereals to reduce hidden hunger in Africa</i>	
Associate Professor Alex Johnson	107
<b>Q&amp;A:</b> <i>Chair:</i> Dr Sarah Pearson	112

*continues overleaf*

KEYNOTE: AFTERNOON	
<b>Achieving impact and outcomes with farmers and families</b>	
Rebecca Boustead	114
<b>Q&amp;A: Rebecca Boustead &amp; Dr Alessandro Demaio. Chair: Malcolm Thompson</b>	123
CONFERENCE SYNTHESIS	
Professor Robyn Alders AO	130
CLOSING COMMENTS	
Dr Colin Chartres	135
CONFERENCE DELEGATES, including Crawford Fund Scholars 2018	137
INDEX	143

For **Media coverage of the 2018 conference**

see [https://www.crawfordfund.org/wp-content/uploads/2018/09/CrawfordFundConference2018\\_MediaCoverage\\_05September2018.pdf](https://www.crawfordfund.org/wp-content/uploads/2018/09/CrawfordFundConference2018_MediaCoverage_05September2018.pdf)

For the **Summary of the 2018 conference by the RAID Listeners**

see <https://www.crawfordfund.org/news/news-2018-crawford-fund-annual-conference-keynote-listeners-report-august-2018/>.



Conference scholars with Board, Coordinators and staff of the Crawford Fund  
August 2018

# Acknowledgements

**The Crawford Fund wishes to thank the Chairs of the conference sessions, and the sponsors and supporters of this year's conference and scholar program**

## **CHAIRS**

The Hon. John Anderson AO

*Chair, The Crawford Fund*

Dr Mario Herrero

*Chief Research Scientist, CSIRO Agriculture and Food*

Professor Maggie Gill

*Chair of the Independent Science & Partnership Council, CGIAR*

Dr Sarah Pearson

*Chief Innovation Officer, Department of Foreign Affairs and Trade*

Malcolm Thompson

*Deputy Secretary, Department of Agriculture and Water Resources*

## **SPONSORS AND SUPPORTERS**

AgriFutures Australia

Australian Academy of Technology and Engineering

Australian Centre for International Agricultural Research (ACIAR)

Australian Eggs

Australian Volunteers Program

Bayer Australia Ltd

Centre for Global Food and Resources, The University of Adelaide

Central Queensland University

Columbia University School of International and Public Affairs

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Department of Agriculture and Water Resources

Department of Foreign Affairs and Trade (DFAT)

Elanco

Faculty of Veterinary and Agricultural Sciences, The University of Melbourne

Fenner School of Environment and Society, The Australian National University

Grains Research and Development Corporation (GRDC)

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Kellogg Asia Pacific

La Trobe University Institute for Agriculture & Food

Plant & Food Research NZ

Plant Health Australia

QUT Institute for Future Environments

School of Agriculture and Food Sciences, The University of Queensland

Simplot Australia Pty Ltd

Tasmanian Institute of Agriculture, University of Tasmania

The University of Sydney

The University of Western Australia Faculty of Science

University of New England

Waite Research Institute, The University of Adelaide

Western Sydney University School of Science and Health

World Vegetable Center

### **SCHOLAR SUPPORTERS**

In addition to the conference scholars supported by our State and Territory Committees and some individual donors, the following have supported conference scholars this year:

Australasian Agricultural & Resource Economics Society (AARES) Queensland Branch,  
with School of Economics, The University of Queensland

AARES South Australia Branch

Central Queensland University

Centre for Nutrition and Food Sciences, QAAFI (Queensland Alliance for Agriculture  
& Food Innovation), The University of Queensland

Elanco

Faculty of Veterinary and Agricultural Sciences, The University of Melbourne

Gardiner Foundation

Graham Centre for Agricultural Innovation

Marcus Oldham College

Plant Health Australia

School of Agriculture and Food Sciences, The University of Queensland

University of New England

University of the Sunshine Coast, Forest Industries Research Centre.

## Foreword

Each year, the Crawford Fund board considers potential topics for the annual conference, from across a range of agricultural disciplines. This year we opted for the food, nutrition and health nexus, because this topic is of major concern to the developing world these days, and because we now face both under-nutrition and over-nutrition almost side by side in many countries, including Australia where overweight and obesity issues are putting an increased strain on our health facilities and budgets.

The Green Revolution of the 1950s to 1970s and the follow-up work to increase crop yields were incredibly successful, allowing a rapidly increasing population to be fed, globally, in a way that even Sir John Crawford would hardly have believed possible. Arguably, the world can produce enough food to feed everyone, but economic, political and distributional issues as well as wars and various sorts of distress mean that people still go hungry. Hunger and malnutrition account for 1.5 times more deaths now than disease and natural disasters, and it would appear that around 800 million people are chronically under-nourished. That figure has increased by 38 million since 2015, and yet it is probably dwarfed by the number of people now overweight, over-nourished or obese.

Growth in individual wealth across the world has led many people to change their dietary preferences to Western-style diets, high in proteins (meat and dairy products), lower in whole grain (cereals, fruit and vegetables), high in processed food, rich in sugar and salt. As a result over 2 billion people are over-nourished.

Compounded in this is the deeply disturbing matter of food waste in western societies. In Australia, food waste accounts for between 30% and 45% of food produced in this country in our domestic markets. We addressed the topic in the Crawford Fund's 2016 conference, and it remains of great concern.

To produce the right food and the right quantities to satisfy diets globally will require a great deal of effort. That stress on land, on water, on other resources including fertilisers and energy places further strain on the natural environment. However, Australia is a sophisticated and well-to-do country that has enormous expertise in agricultural science and agricultural know-how. Australians can 'punch well above our weight' in these fields. In agriculture, food, nutrition and health, Australia can have a very large positive impact.

The challenges posed by these complex issues set the scene for the speakers at today's conference. If we have the will, there will be a way through these issues.

This year's conference delegates (pp. 137–142) include 44 young scholars – young scientists with genuine interest in international agricultural development. They can and must be the heroes of tomorrow, committed to seeking out the evidence and to drawing knowledge from the evidence. The Crawford Fund would like to acknowledge the supporters (listed above) who, with the Fund's State and Territory Committees, have guaranteed those scholars this opportunity to take part in today's agriculture, food, nutrition and health discussions. The scholars' names and supporters are also listed on the Crawford Fund website.



The conference delegates also include members of Researchers in Agriculture for International Development – RAID. The Crawford Fund’s support for RAID is another part of our commitment to the next generation, encouraging young people’s enthusiastic embracing of what we do. RAID members again this year summarise the whole conference in a short paper published online at the Crawford Fund website.

Finally, the Crawford Fund gratefully acknowledges the contributions of the Chairpersons of this year’s sessions, and the sponsors who have supported this conference, and Ms Cathy Reade and her team without whom the conference would not take place.

A handwritten signature in blue ink, appearing to read "John Anderson", with a long horizontal line extending to the right below the name.

The Hon. John Anderson AO  
Chair, The Crawford Fund