

# Access Not Excess

The search for better nutrition

Edited by Charles Pasternak

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J.C. Waterlow

**Towards a hunger-free India**

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The contributors to *Access Not Excess* explore a passage through the morass of malnutrition, a term now redefined to deal with both chronic hunger and the health consequences of excess consumption. While *Access Not Excess* does not propose a single answer to the goal of better nutrition it can, by setting out the obstacles and the several proposals for overcoming them, encourage all those who want to join in and to support the vital worldwide search.

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# Preface

*It is a reproach to religion and government to suffer so much poverty and excess*  
William Penn (1644-1718)

These words ring as true today as they did when written by the founder of the American colony that would bear his name. On the one hand, half the world lives below the poverty line, defined as an income of less than two dollars a day. Of these, one billion people have to make do on one dollar a day, and are severely malnourished; between seven and ten million of them die from this cause every year - twice as many as those dying from HIV/AIDS, malaria and tuberculosis combined. On the other hand, more than a billion adults are overweight, with at least a third clinically obese (body mass index of > 25 or 30 kg/sq m). Whether obese or merely overweight, their life expectancy is significantly below the average, with a greater propensity for developing type-2 diabetes, cardiovascular disease, hypertension leading to stroke, and certain forms of cancer.

You might think that these two groups – the undernourished and the overfed – are geographically distinct: the former live in the least developed countries (particularly those in Asia and Africa), the latter in the most developed countries (particularly those in North America and Europe: one in three within the USA is overweight). But you would be wrong. Although the majority of undernourished people indeed live in the least developed countries, and the majority of overweight people live in the most developed countries, there is surprising overlap between the two categories. Thus some 30 million people in the developed world live in poverty and go hungry on a daily basis, while >10% of women in sub-Saharan Africa are overweight; according to this statistic<sup>1</sup>, almost 40% of women in Latin America and the Caribbean, and nearly 50% in the Middle East and North Africa, are overweight.

The link between poverty and hunger is obvious and stark. The poorer you are, the larger the percentage of your meagre budget you spend on food. In Nigeria, for example, this is 73%. In the USA, the figure for the poorest households is 16%; for the wealthy it is even less. Poverty leads to disease. Undernourished children, and adults too for that matter, are much more prone to infectious disease – because of a malfunctioning immune system that would otherwise fight off the invading microbe. A third of the world's inhabitants – largely those in southern Asia and Africa – are unable to access sufficient food because of poverty. Since this topic is not discussed as such in the present volume, I urge readers of *Access Not Excess* to supplement their understanding by noting Jeffrey Sachs' optimistic views on this topic<sup>2</sup>. But even if the means of the impoverished were to improve, would there be enough food around to feed them in the future<sup>3</sup>? It is precisely in southern Asia and Africa that the

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<sup>1</sup> see <http://www.fao.org/FOCUS/E/obesity/obes1.htm>

<sup>2</sup> Jeffrey D Sachs: *The End of Poverty. How We Can Make It Happen In Our Lifetime* (Penguin Books, London, 2005)

<sup>3</sup> Can science feed the world? *Nature* 466: 531-2 and 546-61 (2010)

population is expanding fastest. The world population is estimated to reach nine billion by 2050, yet agricultural productivity actually *declined* between the 1970s and the 1990s.

We have seen that malnutrition, whether due to lack of access to food and water (contaminated drinking water and poor sanitation kill one and a half million children under the age of five every year), or the result of an excess of calories, is a global problem. Its importance cannot be over-stated. That is why the Oxford International Biomedical Centre (OIBC; [www.oibc.org.uk](http://www.oibc.org.uk)) tackled the issue in its Spring Conference of 2008 with a symposium entitled 'Access, not excess: novel ways to nourish the world'. Some of the contributors to that symposium have now submitted chapters to the present volume. Other authors have subsequently been invited to write an article. The result is a deliberately diverse panorama of views, by international experts, on agriculture and food security, on the effects of poverty and bad land management, on novel forms of rice and cassava, on ways of ameliorating lack of food by low-cost technology and by sophisticated genetic modification, on the causes of obesity and its control, on telling children how to eat better and farmers how to farm more effectively.

Let me elaborate. Over half of the chapters are devoted to lack of access. **Waterlow**, a doyen in the field of malnutrition, shows the relationship between poor diet and growth impairment or stunting, across the world. **Bhavani & Swaminathan** tackle the problem in regard to India, and offer a six-point action plan for making their country hunger-free. **Nyange** and colleagues emphasise the particular plight of Africans. Their remedy focuses on biotechnology, a topic derided by **von der Weid**, who advocates instead low-cost technology, and by **Tudge**, whose solution is to promote small-scale, or 'real' farming, a point echoed by developing countries at a recent Global Conference on Agricultural Research<sup>4</sup>. 'Small is best' is advocated also by **Hulme**, who reminds us that this type of agriculture was recommended already in the Good Book, and by **Shetty**.

No publication that treats food security can fail to mention the problems facing China's huge population. **Kang** and **Zhang** illustrate how over-cropping and excessive irrigation – as well as climate change – can turn an oasis into a desert, and **Sheehy** and **Mitchell** point to the greater photosynthetic ability of maize over rice; their proposal is to re-jiggle the metabolism of rice so that it behaves more like maize. The advantages of genetic modification to improve crop yields in Africa, as referred to by **Nyange** and colleagues, raise hackles across the world. **Malcolm** is on hand to reassure us over this issue. Increasing the nutritional value of food (1.5 billion are deficient in micronutrients like iron, zinc and vitamin A), or 'biofortification', can be achieved by traditional breeding as well as by genetic modification: **Winkler** discusses both methods, and **Sayre** shows that as far as cassava is concerned, genetic modification achieves results that traditional breeding cannot. So it is not surprising that Marion Guillou, chief executive of INRA (France's institut national de la recherche agronomique), considers that 'genetics ... is still the number-one technique for increasing yields. For Africa to improve its yields, we clearly need new genetically selected varieties, engineered by either genetic modification or classic breeding techniques'<sup>4</sup>.

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<sup>4</sup> What it will take to feed the world. *Nature* 464: 969 (2010).

So far as excess is concerned, **Johnston** highlights the problem of obesity and reminds us that culture and socio-economic status are major factors in its aetiology, while **Trayburn** elucidates the relationship between genes, appetite and life style. The young, these days, are particularly vulnerable: worldwide some 22 million children under five are estimated to be overweight. So it is encouraging to read **Leith's** solution to the problem: interest youngsters in cooking for themselves, and avoid excessive consumption of fat and carbohydrate (especially sugar). Surprisingly, as **Henry** and **Thondre** show, the precise form in which carbohydrate is ingested makes a difference. Finally, **Shetty** usefully sums up much of the fore-going, and stresses that private companies as well as international agencies have a role to play in solving the problem of access and excess.

What outcome can we expect from this wealth of information? A better understanding of the problem by politicians and decision-makers, by farmers and researchers, by the public and professionals, by teachers and their students. And perhaps by another conference on 'Access not excess'.

I would like to thank the Syngenta Foundation for Sustainable Agriculture, and Vision – Insights and New Horizons, for their support of the original symposium. I am particularly grateful to Eldred Smith-Gordon for taking on this project as publisher. If any good comes out of it – as I hope it will – it is to them that we are all indebted. All royalties from the sale of this volume will go towards the work of the Oxford International Biomedical Centre: the major goals of this charity are to improve access to medicines for all in Africa, and access to learning for youngsters, particularly in the UK.

Charles Pasternak, September 2010

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**John Waterlow** died on 19 October 2010. If you seek his monument look around. We are grateful to Dr Joan Stephen and Professor Prakash Shetty for help with the proofs of Chapter 1.