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Book reviews

Nutrition and Immune Function. Edited by P. C. Calder, C. J. Field and H. S. Gill. Wallingford, Oxon. and New York: CAB International Publishing. 2002. Hardback, pp. 448. £65 (US$120). ISBN 0 85199 583 7

The aim of this book is to provide an up to date account of the interactions between nutrition and immune function, with an emphasis on the mechanisms of action of a wide variety of nutrients and their impact on human health. The intended audience is advanced students and researchers in nutritional science and immunology. The book is divided into three distinct parts. Part 1 contains two chapters. The first of these provides the reader with an overview of the immune system that includes a relatively brief but succinct description of its component parts and their functional roles. The very short section on innate immunity was rather too thin for my liking, but the description of the mechanism of acquired immunity is more comprehensive and by the end of the chapter the reader will have a pretty good understanding of how the immune system protects the body against infections. The second chapter discusses the possible experimental approaches that can be used to evaluate the effect of nutrients on immune function. It also describes, using relevant examples from the literature, the types of assays that can be used to measure changes in immune function. This is important, as there have been substantial advances in recent years in immunological methods, particularly in the use of flow cytometric techniques. The new approaches now provide a wide range of analytical methods that can be used for hypothesis testing. This chapter allows the reader to understand the principles of the different assay methods without too much chemical detail.

Part 2 contains eleven chapters. The first of these deals with the effects of protein-energy malnutrition on immunity and risk of infection; this chapter also describes how intra-uterine growth retardation (usually due to poor maternal nutrition) is associated with impaired immune response and enhanced susceptibility to infection. The following nine chapters are devoted to a particular nutrient or a group of related nutrients: fatty acids, arginine, glutamine, sulfur-containing amino acids and glutathione, vitamin A, antioxidant vitamins (vitamins C and E and carotenoids), Zn, Fe and Se. Each chapter considers the effects of nutrient deficiency and (to a lesser extent) excess on immune function and emphasises the mechanistic basis of nutrient-immune interactions. Although the emphasis of the book is on man, no opportunities are missed to provide supporting results from relevant animal studies, as obviously for ethical reasons there is a limit to what can be studied in intact human subjects. Most of the chapters contain twelve to fifteen pages of text including tables and figures, followed by a substantial but not over-facing bibliography. All of the chapters apart from chapter 7 (Sulfur amino acids and glutathione) finish with a short conclusion, which is useful if the reader is only interested in the take-home message. There is little overlap of material in this section with a few predictable exceptions (e.g. both the chapters on glutathione and antioxidant vitamins deal with oxidative stress and antioxidant defences). The last chapter in part 2 deals with probiotics, for which there is a great deal of interesting new results. There appears to be no mention in the book of the effects of herbs (e.g. Echinacea), flavonoids, caffeine or alcohol on immune function. Given the number of people I know that drink alcohol, this seems a surprising omission.

Part 3 contains five chapters that take a quite different approach to the rest of the book. Two of these chapters look at different aspects of the life cycle: the impact of breast-feeding on immunity in the newborn and the impact of nutrition on immune function and susceptibility to infection in elderly people. Sandwiched between these two chapters are two others on food allergy and the effect of nutrition on immune responses to exercise. I was rather disappointed to find out that the chapters concerning the effects of exercise and ageing on immune function were limited to only seven and twelve pages of text (including tables and figures) respectively. The unavoidable outcome of this is that there are omissions, and only a limited discussion of the impact of nutrients on the immune function of athletes and the aged. I was also surprised that there was no reference to the excellent recent book entitled *Nutrition and Exercise Immunology* (Nieman & Pedersen, 2000). The final chapter of this section of the book considers the public health implications of our developing knowledge of the effects of nutrition on immune function and susceptibility to infection. The book contains a reasonable number of useful illustrations and informative tables, although I would prefer to see more figures illustrating some of the experimental evidence that is discussed in the text. At the purchase price of £65, I suspect that this book will not be attractive to students. It will, however, be an essential resource for any scientist interested in knowing how what people eat affects their immune function and susceptibility to infection. I certainly enjoyed reading it and am better informed for having done so.

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Reference

Nieman DC & Pedersen BK (editors) (2000) *Nutrition and Exercise Immunology*. Boca Raton, FL: CRC Press.