Nutrition Research Reviews (1998), **11**, 1–3

Editorial

This issue marks a new departure for *NRR*. This year we start publishing two issues per year, appearing in June and December. Each issue will be slightly smaller than the average preceding annual issues: we are aiming at about 7–9 papers per 6 monthly issue. From an editor's point of view, this gives more flexibility. In an annual publication, papers are dealt with as a batch. Late arriving papers result in a slimmer volume (as occurred last year in volume 10) and then there is a delay for twelve months before the paper can be published. As publication frequency increases, papers can be dealt with on a more continuous basis. There is more likely to be another paper to fill the gap and authors benefit by not having to wait so long to get their paper published.

It is most noticeable to me as editor-in-chief for seven years now that it is becoming ever more difficult for authors to meet targets for the receipt of their papers and, in some cases, even to respond to letters. This is no doubt due to increasing pressures on academics' time for teaching, administration, grant submissions, report writing, performance assessments and all the other bureaucracy with which, to its detriment, scientific research has been surrounded.

This issue begins with a thoughtful and thought provoking paper by *Day and colleagues* in which they offer a unifying conceptual framework for understanding how animals, including man, learn to choose their foods and control their nutrient intake. I hope that readers who, like me, have no firm grounding in the concepts or methods of food choice research, but who are interested in the subject, will give the paper the mental commitment it deserves. Though well written, this is not easy reading and will repay careful study. The topic is not without controversy and, in another new departure for *NRR*, I have invited the referee to publish a critical response based on his thoughtful and penetrating report to me. This will appear in the next issue (vol.11(ii)) in December together with a brief counter-response from Day and colleagues.

It is not our intention to follow this course as a matter of routine but where a topic commands sufficient general interest and is clearly one that can be approached intellectually in quite different ways, then we shall repeat the exercise. It is a practical alternative to a correspondence column, which is rarely viable in a journal that has a large time gap between issues.

This episode prompts me to say something more about our refereeing system. Each paper to be considered for publication by *NRR*, whether 'invited' or 'unsolicited' is read by myself, by the editor who is most familiar with the topic and an independent referee (two referees if the paper is written by an editor). When a paper is invited (on the bases that the author was selected as an authority on the topic and as a reasonably good communicator) it is clearly difficult, not to say embarrassing, to find ourselves in the position of being unable to accept it for publication. Such an event has occurred once or twice in *NRR*'s 11 year history. A referee normally makes invaluable suggestions for improvements in the balance of the review and indicates where aspects of a topic have been omitted or where superfluous material could be erased. He or she often queries the interpretation of certain findings or suggests alternative ways of thinking about concepts. This was what happened in respect of the paper by Day and colleagues and I hope that readers will benefit from reading the follow-up in the next issue. In the final analysis, however, the views of the author(s) are respected and it is not the role of the journal, its editors or referees to impose views on authors.

Brand-Miller and Holt describe the traditional diet of the Australian Aboriginal hunter-gatherers and compare expected nutrient intakes with those from modern cultivated foods. Aboriginal diets had a relatively low carbohydrate (especially starch) content but were rich in

dietary fibre. The low glycaemic index would have protected Australian Aboriginals from a genetic predisposition to insulin resistance and its consequences. The authors suggest that we must consider the ramifications of dietary guidelines that recommend large amounts of plant foods to everyone including Aboriginals. Some of the consequences may include higher rates of non-insulin-dependent diabetes mellitus because the glycaemic index of modern carbohydrate foods is high. The diets of modern hunter-gatherers such as Australian Aboriginals may be a reference standard for modern human nutrition and a model for defence against certain diseases of civilization.

It is surprising how recently the widespread problem of zinc deficiency and its adverse effects on human health have been recognized. Such deficiencies tend to occur in developing countries with predominantly plant based diets and low consumption of animal tissues. *Gibson and Ferguson* analyse and discuss different strategies – supplementation, fortification and dietary modification – for combatting zinc deficiency. They conclude that an integrated approach is required in conjunction with national food nutrition and health programmes. Such projects will be successful only if they are well publicized, they have the commitment of top people in the country, there is a stable infrastructure, long term financial support, and capacity to control quality and monitor and enforce compliance at a national or regional level. Whereas *NRR* exists only as a medium for reviewing and assessing *scientific* issues, successful nutritional outcomes involve much more than scientific appraisal: *political* follow-up is an essential component.

The influence of so-called antinutritional factors in limiting the availability of nutrients from diets has long been familiar to nutritionists. It is a problem in human as well as animal dietaries but the approaches to solving the problem are often different. Human diets are now required to provide for optimum health in a long-lived animal in whom diseases of old age are progressively becoming more important. Farm animals are seldom allowed the luxury of old age and the formulation of their diets seeks to optimize growth for least cost. Some raw materials, attractive economically, may contain relatively high levels of antinutritional factors. *Bedford and Schulze* describe the use of xylanase, *beta*-glucanase and phytase enzymes to overcome the problems associated with the presence of antinutritional factors in pig and poultry diets. Xylans and *beta*-glucans are plant cell wall polysaccharides that are not digested in the small intestine of monogastric animals; phytate is a phosphorus storage compound that complexes several essential minerals, limiting their bioavailability. A major problem highlighted by the review is the variability of animal responses to enzyme treated feeds and the authors describe strategies for overcoming this. They predict that most monogastric feedstuffs worldwide will be enzyme treated by the year 2000, some enzymes being introduced at the point of feed manufacture; others in the process of production of raw materials such as oilseed meals.

The roles of bacteria and protozoa in degrading complex food components in the rumen of ruminant animals of agricultural importance are well known. It comes as a surprise to learn that contributions from rumen anaerobic fungi have been properly recognized only since 1975. *Gordon and Phillips* give a scholarly description of these unusual organisms, their metabolism of plant carbohydrates and their place in the rumen microbial ecosystem. Of particular interest to agricultural nutritionists will be the survey of currently known effects of ruminant diets upon them and ways in which the fungal populations can be manipulated to make best use of poor quality herbage. In this respect, this paper makes interesting reading alongside that of *Bedford and Schulze*.

Pařízková's review of interactions between nutrition and physical activity is timely. Nutritionists are increasingly becoming aware of the limitations of regarding nutrition in iso-

lation and of the importance of considering interactions with genetic background on the one hand and non-nutritional environmental factors on the other. The author has spent much of her career painstakingly investigating physical activity in relation to nutrition and here concentrates on such interactions in mothers and their offspring, seeking to discover whether there may be implications for health later in life. Much of the firm evidence that, for example, exercise of the mother during pregnancy can result in enhanced cardiac function in the offspring which is carried through into later life, comes from studies of rats. But, as the author shows, there are parallels in man and it is timely to consider them in view of current interest in early nutrition and later health. Perhaps as nutritionists read about the techniques *Pařízková* uses for studying the nutrition of animals given prescribed levels of exercise, they may be tempted to incorporate an exercise component into their experimental designs. This may be more helpful than continuing to publish work on confined sedentary animals.

Such are the difficulties, practical and ethical, of studying digestive events in living animals, that physiologists and nutritionists have long tried to simulate these events *in vitro*. These have not been entirely informative because they normally simulate only part of the process in a way that is far removed from reality. The development of new materials and of sophisticated computerized control systems, coupled with a vast literature on all aspects of digestion has now facilitated the development of more realistic models *in vitro*. Such a system is described, in the final paper of this issue, by *Smeets-Peters* and her colleagues.

These authors first gathered information on all aspects of the physiology of the stomach and small intestine of dogs. Data on transit times, pH, composition and rates of secretion of saliva, gastric juice, pancreatic juice and bile were used in the simulation. The model consists of simulations of the major segments of the gastrointestinal tract (stomach, duodenum, jejunum, ileum, with the exception of the large bowel) constructed in glass and silicon. Flow of secretions and digesta is regulated by computer controlled pumps. Electrodes placed at intervals monitor pH. The authors end their paper by illustrating the concordance between values provided in the model and predicted values for pH throughout the gastrointestinal tract and for gastric emptying rates using dry dog food as an experimental diet. Given further development, this model should prove an invaluable bridge between the crude and oversimplified *in vitro* tests hitherto used to simulated digestive processes and digestion *in vivo* which is extremely difficult, if not impossible, to follow experimentally.

I hope that readers will find the reviews in this issue interesting, informative and thought provoking. If you have any comments whatsoever about the journal or articles in it, do not hesitate to write to me.

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