PROCEEDINGS OF THE NUTRITION SOCIETY

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SYMPOSIUM ON 'NUTRITION AND REPRODUCTION'

Introduction

Nutrition and reproduction are both very important branches of biological and medical science. All too often research, teaching and clinical practice fail to recognize the vital links between the two. Many experiments into the control of reproduction do not take into account the nutritional status of their subjects; it is rather more difficult for nutritional studies to ignore the fact that their subjects are pregnant or lactating.

This symposium draws together eight speakers whose own researches, and the literature they have reviewed, span the disciplines of nutrition and reproduction using examples from man, and from laboratory, farm and wild animals. Of particular note is the way in which critical interventions are being used to manipulate both metabolic status and reproductive control systems. In the past it has proved to be notoriously difficult to get definite answers to questions concerning the effects of nutrition on ovulation, for example, because of the small range of ovulation rates in most species. Now, measurements of gonadotrophins and gonadal steroids, as elegantly described by Dr Steiner, allow parametric tests to be applied and estimations of concentrations and turnover of metabolites and metabolic hormones allow a much more adequate description of nutritional status than the 'high' or 'low' planes previously used. Short-term, reversible challenges, such as with 2-deoxyglucose which blocks glucose uptake by tissues, have been of particular use.

Dr Kirkwood deals with effects of nutrition on puberty, particularly with respect to pigs, while Drs Louden and Hocking introduce aspects of nutritional interactions with reproduction in wild mammals and in poultry, respectively.

Although the most obvious link between nutrition and reproduction is the effect of variations in the quantity and quality of the former on the outcome of the latter, also important are effects of reproductive changes on nutrient requirements and voluntary food intake, this being the subject of Dr Forbes' paper.

Dr Mary Seller's paper introduces some aspects of the potential teratological influence of nutritional substances. Many amino acids, minerals and vitamins can

act when they are either in excess or, sometimes, when they are in deficit. Some examples have been known to teratologists for a long time, but the possible protective effect of careful preconceptional vitamin supplementation to prevent neural tube defects in man is a recent and exciting development for this very tragic condition. Dr Elaine Whitaker speaks of the connections between obesity, its accompanying endocrinological derangements and effects on fecundity, with special reference to genetically obese rats. Dr Mellor deals with the vexed question of the relation of maternal nutrition to placental and fetal growth as well as mammary growth in preparation for lactation. It ought to be clear that all of these depend on good maternal nutrition, but in fact the relations are complex and the subject of considerable dispute. Some of the species differences may be due to the different relative amounts of new tissue in relation to body size, and Dr Mellor approaches these problems by discussing the sheep as compared with man.

Many questions still remain. In particular, what is the mode of action of malnutrition on the hypothalamic–pituitary–gonadal axis? How is puberty controlled—is the prepubertal animal metabolically stressed? Is obesity a direct cause of poor reproduction?

The very complexity of the subject of this symposium makes it particularly important that research should concentrate on experiments designed to answer simple questions in an unequivocal manner. This information can then be used to synthesize quantitative models whose deficiencies will point clearly to areas for future experimental work, and possibly to developments in clinical practice.

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