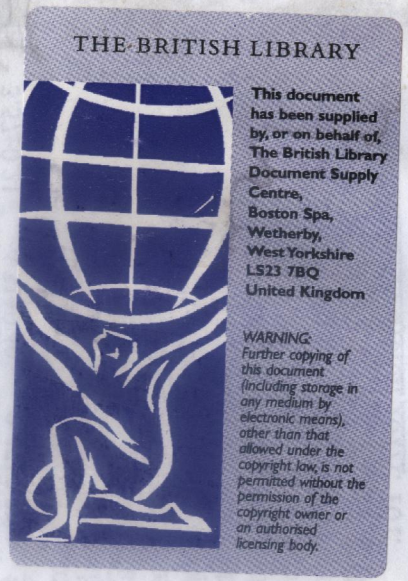

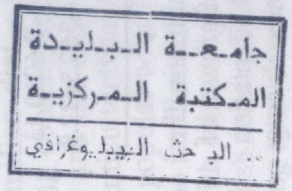

Proc. Nutr. Soc. Aust. (1994) 18

EFFECTS OF EARLY FEED RESTRICTION ON GROWTH PERFORMANCE AND DIGESTIVE ENZYME ACTIVITIES IN BROILER CHICKENS

J.P. SUSBILLA, I. TARVID, C.B. GOW, G. PARKINSON* and T.L. FRANKEL

Feed restriction for a short period within the first two weeks after hatching leads to compensatory growth (e.g. Plavnik and Hurwitz 1985). In order to gain insight into mechanisms operating during compensatory growth, the effects of feed restriction on intestine growth and digestive enzyme activity were studied.

The experiment was carried out in two parts. In one part, 80 day-old broiler chicks were placed in floor pens (10 birds/pen; four pens per treatment) and raised until day 40 for measurements of body composition and feed conversion ratio. In part 2, chickens were placed in cages from day 0 to day 25 for the measurement of digestive enzyme activities. The two treatments were ad libitum feed intake (Control) and feed intake restricted to 40% of the intake of the Control group (FI 40) from day five to day 11. Commercial starter broiler feed was given from day 0 to day 25 and broiler finisher from day 26 to day 40. After starving for 16-18 hours, the birds were killed on days 12, 19, and 26 for in vitro determination of peptidase activities. Glycyl L-leucine was used as a substrate for dipeptidase and L-leucine ß-naphthylamide as a substrate for aminopeptidase activities (Tarvid 1992) on the surface and in homogenates of three equal segments of the small intestine. The segment activities were then expressed as an average for the total ileum and jejunum.

Immediately following the period of feed restriction (i.e. day 12), Group FI 40 birds kept in floor pens had a significantly lower ($P<0.01$) mean body weight (212.4 g ± 2.7) than that of the Control birds (362.1 g ± 3.4). However on day 40, there was no difference in body weight between the Control group (2268 g ± 37) and Group FI 40 (2168 g ± 40). The mean body weights, weights of small intestine and peptidase activities of birds in cages are shown below:

Age	day 12		day 19		day 26	
Treatments	Control	FI 40	Control	FI 40	Control	FI 40
No. of birds	6	6	5	5	6	6
Body weight (BW), g	273.2±6.0	168.1±4.6**	663.7±8.7	458.8±35.0**	1062.8±38.5	900.9±16.6**
Intestine, g/kg BW	30.2±1.4	35.3±2.6	22.4±1.3	22.3±1.7	18.5±0.8	18.1±0.7
Surface activity						
aminopeptidase	0.25±0.01	0.35±0.02**	0.19±0.02	0.25±0.01*	0.18±0.01	0.20±0.01
dipeptidase	7.67±0.49	11.87±1.20*	6.28±0.48	7.88±0.63	5.69±0.53	4.92±0.35
Homogenate activity						
aminopeptidase	3.57±0.21	4.31±0.40	2.47±0.07	3.47±0.14**	2.27±0.15	2.60±0.13
dipeptidase	460.1±44.8	449.7±62.8	376.2±10.9	459.9±10.7	338.6±24.7	360.3±22.3

activity expressed as mmoles leucine/g intestinal tissue per min; *$P\leq0.05$; **$P\leq0.01$

The feed restricted birds exhibited compensatory growth and were able to maintain the growth of the small intestine during the period of feed restriction. The maintenance of growth of the small intestine and the increase in its digestive enzyme activity may be a functional adaptation to the effects of feed restriction which enables support for the added demands during compensatory growth.

PLAVNIK, I. and HURWITZ, S. (1985). Poult.Sci. 64: 348.
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CHANGING ATTITUDES TO DIET AND NUTRITION

E. DANGAR

I. INTRODUCTION

(a) Seeking long-term health

The community generally has a far more long-term outlook on health than used to be the case. There are two dimensions to this. Firstly, with the increasing "elasticity" of age (the blue-rinse set has disappeared, Jane Fonda is in her mid-fifties and the notion of being elderly stretches further out) there is a greater emphasis today on prolonging personal vitality in order to maximise "life options".

Secondly, there is the issue of minimising the risks of "modern diseases". People no longer believe that these are the result of heredity or fate. Recent research undertaken by DRG indicated, for example, that "good diet" and "exercise" were together attributed a 75% contribution to maintaining long-term health while well over 90% of the population believed that a "good diet" played an essential role in avoiding problems such as heart disease and even cancer. In this respect, people have largely embraced the notion of personal responsibility for their physical well-being and are increasingly adopting a "preventative" stance towards health.

II. INCREASED KNOWLEDGE

The fall-out of the "health revolution", which had its roots in the 70s, is now being felt deep in the community. Consumers today perceive themselves to be far better informed about diet and its physical effects than was their parents' generation. While literal knowledge may often be fairly superficial and indeed misconceptions do abound, it is nevertheless true that people today strongly identify with being more knowledgeable about nutrition.

(a) Accessibility to variety

The emphasis on variety, which is a major thrust within the nutrition area, has been accelerated by the sheer choice of foods that are currently available. This is reflected, for example, in the range of fresh produce sold today: alfalfa, bean sprouts, Chinese vegetables, star fruit and tamarillos in greengrocers, pre-prepared satay sticks and spiced marinated stir fry in the butcher, countless varieties of bread in the bakery. Such items are fairly recent components of the Australian diet. Variety is also gaining impetus from proliferating packaged goods, changing cooking styles (stir frying is in the regular repertoire of 61%of female household cooks) and the widespread accommodation of ethnic foods into everyday eating as the effects of multiculturalism in Australia are absorbed.

Asian food is very popular with Thai being particularly favoured; it is perceived to be lighter and fresher than the familiar Chinese and not to contain the "dreaded MSG". Still there is common familiarity with other ethnic cuisines such as Malaysian, Vietnamese, Lebanese, alongside a current, smallish fad for Tex-Mex. Italian has of course been established for some time but it too is assuming new dimensions. Pasta is extremely popular and has assumed a new "sophistication" in that sauces are considerably more adventurous and open to experimentation. While some certainly still eat "spag bol", the repertoire is now significantly extended.

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