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Meat consumption trends and relationship with body composition measurements in adolescents and young adults: the Northern Ireland Young Hearts Project

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Identifying risk factors that contribute to the onset of overweight and obesity is a key public health priority. It has been hypothesised that high consumption of red meat and processed meat can increase the risk of overweight/obesity [1], likely owing to their high energy density. The objectives of the study were to explore trends in meat intake of adolescents over a 10-yr period, and to examine the cross-sectional and longitudinal relationships between red meat, processed meat and total meat intake, and body composition measurements.

Analyses were based on data from the Young Hearts (YH) project (3 cohorts), which was established to examine risk factors associated with cardiovascular disease of young people living in Northern Ireland. In 1989/1990, 12 and 15-yr olds (n = 1015) were randomly recruited from 16 post-primary schools (YH1) across Northern Ireland [2]. In 1997/1999, 489 participants from YH1 were followed-up (mean age: 22·6 yrs) (YH3), achieving a 48·2 % response rate [3]. In 2000, a further cross-sectional survey (YH2000) was carried out; during which 12 and 15-yr olds (n = 2017) were randomly recruited from 36 post-primary schools [4]. Dietary intake was assessed by a 7-d diet history. Meat groups were generated from the dietary data and included: red meat, processed meat, poultry, fish, Indian/Chinese food and total meat. Body composition measurements included BMI and waist circumference (WC).

Adolescent processed meat intake decreased over the 10-yr period, between YH1 and YH2000 (45·24 *vs.* 38·50 g/d; $P < 0·001$), while intakes of poultry (25·32 vs. 33·67 g/d; P < 0·001), Indian/Chinese (30·89 vs. 51·35 g/d; $P < 0·001$) and total meat (127·34 vs. 134·16 g/d; $P = 0·01$) increased. Cross-sectional results showed that meat intake was not associated with BMI or WC in adolescents or young adults, after adjusting for age, sex, social class, tanner stage (adolescents only) energy intake and physical fitness. For the longitudinal analysis, participants were divided (median split) into high or low meat intake groups (red, processed and total meat) at adolescence (YH1) and at young adulthood (YH3). To summarise the change in each of these meat groups between YH1 and YH3, four categories were created, and the relationship with young adult (YH3) BMI and WC examined (see table below). Having high intakes of red meat at both YH1 and YH3, compared to low intakes at both time points was associated with a 2·91 cm increase in young adult WC. Similar comparisons for processed meat and total meat were associated with 2·74 cm and 2·94 cm increases in young adult WC, respectively. An increase in young adult BMI of 0·82 kg/m^2 was observed for those with high intakes of total meat at YH1 and YH3, compared to those with low intakes at both time points.

	Low intake YH1-low intake YH3	Low intake YH1-high intake YH3		High intake YH1- low intake YH3		High intake YH1-high intake YH3	
		B	95 % CI	*B*	95 % CI	*B*	95 % CI
YH3 BMI (kg/m^2)							
Red meat	ref	0·40	−0·39, 1·18	0·17	−0·61, 0·94	0·58	−0·17, 1·33
Processed meat	ref	−0·02	−0·82, 0·77	0·78	0·01, 1·54*	0·50	−0·27, 1·26
Total meat	ref	0·68	−0·10, 1·45	0·00	−0·76, 0·77	0·82	0·08, 1·55*
YH3 WC (cm)							
Red meat	ref	2·27	0·04, 4·50*	2·17	−0·03, 4·38	2·91	0·79, 5·03**
Processed meat	ref	1·65	−0·65, 3·95	3·00	0·79, 5·22**	2·74	0·53, 4·95**
Total meat	ref	2·62	0·39, 4·86*	0·59	−1·61, 2·80	2·94	0·81, 5·06**

Data were analysed using multivariate regression and presented as Beta values (95 % CI). *P < 0·05, **P < 0·01, ***P < 0·001. Adjusted for age, sex, social class, tanner stage, energy intake, VO2 max and adolescent BMI.

Dietary guidelines and intervention programs for reducing meat intake should be implemented early in life as this may assist in preventing obesity in adulthood.

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