European Respiratory Society
Annual Congress 2013

Abstract Number: 2982

Publication Number: 1808

Abstract Group: 6.1. Epidemiology

Keyword 1: Epidemiology **Keyword 2:** Public health **Keyword 3:** Spirometry

Title: Association between processed meat consumption and lung function: Modification by fruit and vegetable intake and smoking

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Body: Higher consumption of processed meat has been associated epidemiologically with poorer lung function. This may be because components of processed meat cause oxidative and nitrative stress. If so, the magnitude of this detrimental effect may depend on intake of antioxidant-rich fruit and vegetables and on smoking habits. In the Hertfordshire Cohort Study we carried out cross-sectional analyses to examine the individual and combined associations of fruit and vegetable and processed meat consumption with lung function in 1551 men and 1391 women aged 59-73 years, using linear regression. Diet was assessed by administered food frequency questionnaire. Interactions between processed meat consumption, fruit and vegetable intake, and smoking were explored. After controlling for confounders, higher consumption of processed meat was associated with lower forced expiratory volume in one second (FEV_1), forced vital capacity (FVC) and FEV_1/FVC in men and women, with larger associations in men (difference in FEV_1 comparing top versus bottom quintile of intake -0.17 litres (95% CI: -0.25 to -0.08), P trend <0.001). Fruit and vegetable intake was positively associated with FEV_1 and FVC, but did not confound the relation between processed meat intake and lung function. In men, the deficit in FEV_1 associated with processed meat intake was larger in those with a low intake of fruit and vegetables (P interaction 0.035); the deficit in FEV_1/FVC was larger in current smokers (P interaction 0.022). An important feature of a healthy diet for optimising respiratory health, especially in smokers, may be the relative intake of foods which influence pulmonary oxidant/antioxidant balance.