Appendix: Table A. Summary of case reports and case series of meat wrapper's asthma, related to PVC fumes from cutting films by hot wire. Medline search from 1950 through May 2007.

First author	Case description	Exposure	Symptoms and signs	Findings	Comments
Sokol et al. 1973	3 cases	PVC fumes from meat wrap film generated when cut by hot wire containing phthalate plastisisers	Episodes of work-related chest tightness and cough;	Positive findings in specific bronchial provocation test	
Andrasch and Bardana 1976	43 yrs old man, smoker, meat cutter	PVC fumes from meat wrap film generated when cut by hot wire containing phthalate plastisisers, HCl, toluene, benzene, hydrocarbons, CO2, CO; thermoactivated price-label adhesive containing elastomers, thermoplastic co-polymers, sulfonamide stabilizers and phthalate plasticizers	Episodes of work-related chest tightness and cough; intensified during the week and decreased out of work	Interstitial pulmonary infiltrates; moderate restrictive and severe obstructive pulmonary disease; rhinorrhea, cough and bronchospasm in PVC challenge test	History, symptoms and signs consistent with asthma; airways reactions related mainly to adhesive label fumes
Pauli et al. 1980 (3 cases)	49 yrs old man, heavy smoker, no personal or family history of asthma, worker at butcher's shop	PVC powder included di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, glycerol momooleate	In weeks of work first symptoms of wheezing and coughing after work day; 4 wks later a severe attack of asthma	In spirometry a completely reversible airways obstruction; In challenge test a 31% decline in FEV1	After changed to another job no further asthma crises
	32 yrs old man, no personal or family history of asthma, worker at butcher's shop	PVC powder included di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, glycerol momooleate	After 5 months developed symptoms of cough, wheezing and nocturnal asthma attacks	Skin test to common allergens negative; Total IgE 72 u/ml	After leaving the meat wrapping area symptoms disappeared.
	26 yrs old man, non-smoker, meat cutter and occasionally meat wrapper	PVC powder included di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, glycerol momooleate	Nocturnal asthma attacks after wrapping meat	Skin test to common allergens negative; acetylcholine challenge test with 25% decline in FEV1; total serum IgE 566 u/ml	
Butler et al. 1981	16 meat wrappers	PVC fumes from meat wrap film generated when cut by hot wire; thermoactivated price-label adhesive	Cough 11/16 Wheeze 8/16 Eyes 10/16 Nose and throat 14/16 Worse cutting 13 Worse labelling 1	Challenge test to PVC film cutting; pre and post spirometry; No effects on FEV1, FEF25-75, or N2; No indication of bronchial reactivity to PVC fumes	No challenge tests to price label adhesive fumes

Brunetti and Moscato 1984	51-years-old man, work in production of artificial PVC leather	Exposed to heated mixture of PVC and dioctylphthalate (DEHP);	Developed wheezing and dry cough at work; symptoms relieved out of work	In specific challenge test: negative to PVC powder; 30 min exposure to dioctylphthalate caused immediate 19% reduction in FEV1 and 52% in MMEF25-75 and another decline in two hours	Diagnosis of occupational asthma with DEHP as a specific cause
Lee et al. 1989	32-year-old man, work in a factory producing bottle caps with plastic seals	Exposed to unheated PVC resin mixture	Developed cough and breathlessness after five years of work; symptoms improved during the weekends and holidays	PEF level improved during weekends; In 20 min PVC resin dust bronchial provocation test a decline in PEF in 8 h reaching max 59% in 16 h	Diagnosis of occupational asthma with PVC resin dust as a specific cause
Moisan 1991	28-year-old woman (1 of 3 cases)	Exposed to fume from residential fire involving plastic laminates, refrigerator components, wall coverings and synthetic drapery material	Cough later in the day; over 3-4 months increasing cough, wheezing and dyspnea	Diagnosis of asthma and treatment with a short course of oral steroids and bronchoactive agents	For 9 years asthma symptoms requiring medical treatment; attacks triggered by respiratory infections, cold air, exercise, and aerosolised irritants
Cipolla et al. 1999	40-year-old woman	Exposed dioctyl phthalate from use of a conveyor belt for bottle stoppers	Developed work-related symptoms of asthma	Diagnosis of asthma based on history, environmental monitoring, pulmonary function tests, PEF monitoring, and elimination of exposure	
Muñoz et al. 2003	26 yrs old woman, light smoker, no history of asthma,	Work in vacuum packing area of fish products	Six months after transfer to new post delayed symptoms, such as cough, bronchospasm and dyspnea, at the end of working day and during the night	Chest x-ray normal, 8.5% eosinophils, total IgE 90 kU/l, an obstructive ventilatory pattern in spirometry with a positive broncodilator test showing a 16% improvement in FEV1, peak flow revealed a 20% work-related variation	After the patient was transferred the symptoms disappeared

Appendix: Figure A

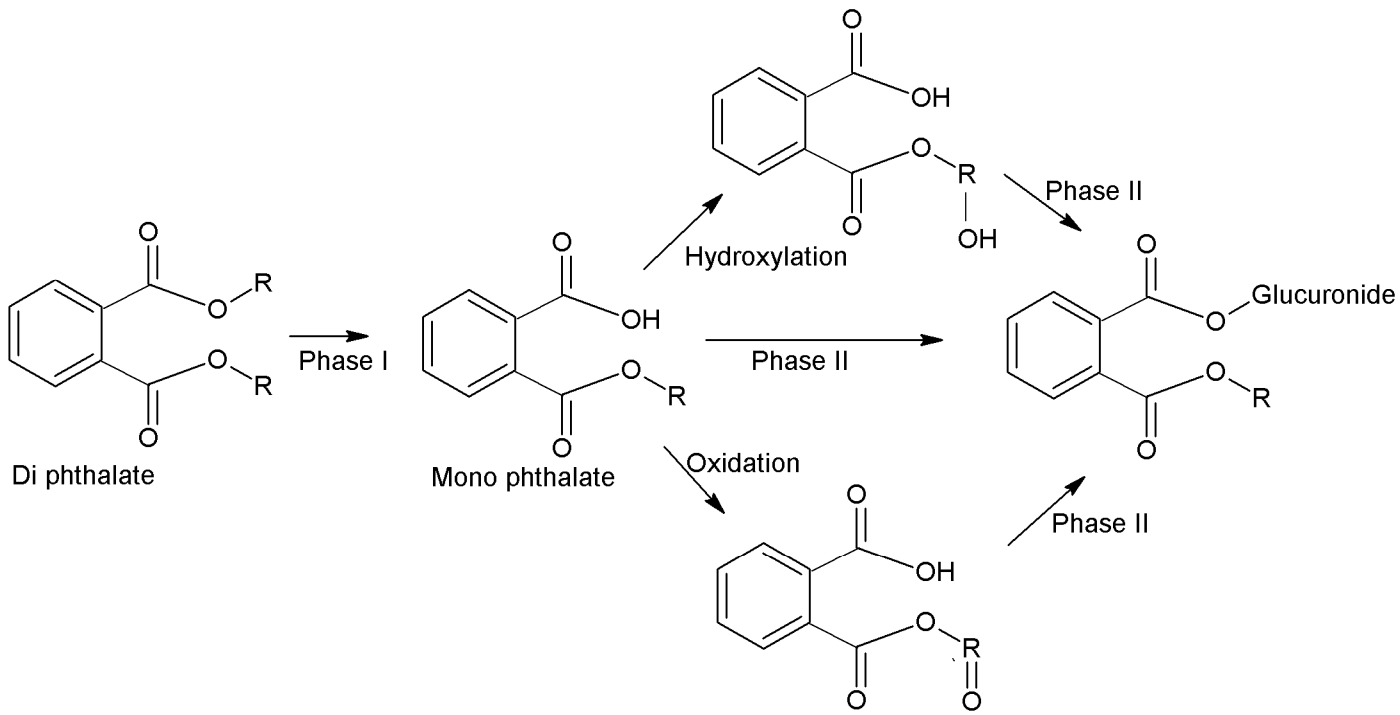

Figure 2. Simplified metabolic scheme for phthalates (adapted from Frederiksen et al., 2007)